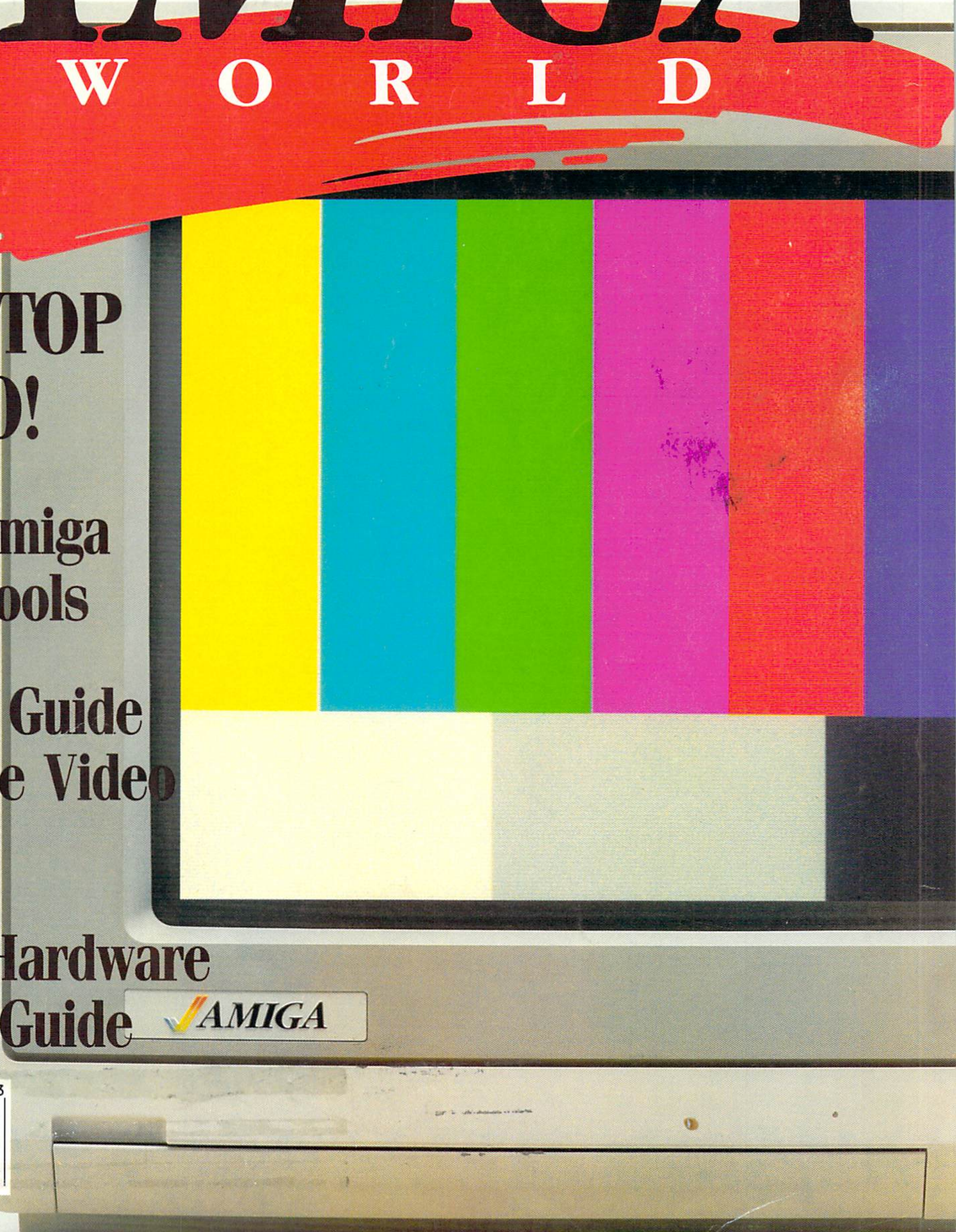
AMIGA WORLD

March 1988
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PHOTON VIDEO

Cell Animator



PROFESSIONAL ANIMATION! —

Now take advantage of "pencil testing" your animation in the privacy of your own home studio! With Cel Animator you can preview scenes, polish your work and know it performs the way you envisioned.

UN-EQUALLED VERSATILITY—

Cel Animator provides versatility that's unavailable with film, or the expensive Lyon-Lamb type stop-motion video tape equipment. With Cel Animator, your drawings are stored on a computer disk so each frame can be called up repeatedly and manipulated within a sequence after being "shot" only once. This is achieved because computer disk storage is "random access," meaning; any information stored on the disk can be called up at random, in whatever order required, as often as necessary!

BREAK THE "SEQUENTIAL" DILEMMA —

Tape and film are "sequential" and require you to shoot a "cycle" over and over again until the required number of repetitions are completed, or re-expose a held drawing for many consecutive frames. Using Cel Animator, however, you may simply create each drawing once, and then create a list, identifying each frame by number, and the program will call up the stored frame from memory and replay it as often as it is called for, or in whatever order you specify, and you can add or delete drawings. Essentially, the program follows your "exposure sheet" for you!

You can also experiment with your timing by simply changing the display time between frames; if you shoot a "pose test" you can adjust your timing repeatedly without reshooting anything, then add your breakdowns, re-time your delays and check again. No need to add in-betweens until you've fine-tuned your pose test.

CONTINUOUS PLAY OPTION—

The program can also replay your sequence of frames in a continuous loop, so you can sit back and review the action repeatedly without having to rewind and play a video tape over and over again, or without ever having to wait for film to be shot, processed, and edited.

SOUND SYNCHRONIZATION—

Cel Animator allows you to digitize your pre-recorded sound track (dialogue, music or effects), and replay them frame by frame; or select any group of frames to replay, enabling you to locate and identify sounds according to frame number prior to doing your animation drawings. Then, review your pose test or completed animation synchronized with your digitized sound track, and you can then print an exposure sheet, vowels and consonants paired with frame numbers.

INTRODUCE COLOR! —

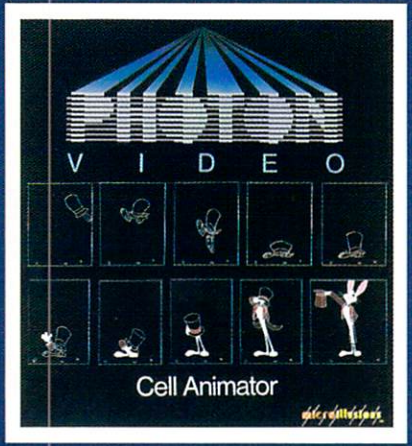
Finally, if you own one of the many paint programs available such as Photon Paint, you can paint your pencil drawings right on your computer, and use Cel Animator to replay them in full color, over any background you create. It is also possible to send your completed color scenes to video tape; thus producing a full color animated sequence right in your own home on your VCR or you can use Photon Video's Transport Controller software.

COMPATIBILITY —

Photon Video Products are fully compatible with most third party art, animation and rendering software systems.

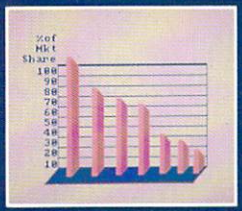
TRANSPORT CONTROLLER —

This module allows you to take your animations frame by frame to video tape, by way of popular frame by frame controllers such as Lyon Lamb.™

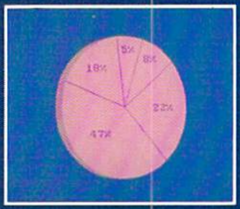
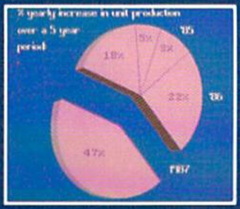


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- EDIT 3D, Photon's powerful solid object Editor.
- RENDER 3D, Photon's amazing solid object rendering system.
- Photon Paint, this immense paint system gives you all you are accustomed to in a professional paint box, plus many advanced features like surface mapping and light source control!











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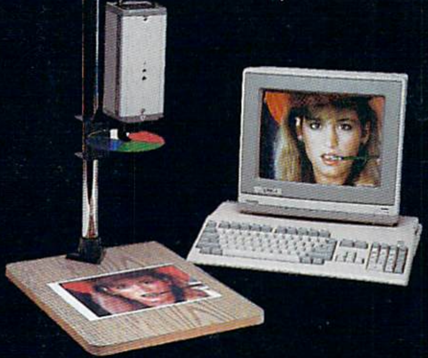
- Dithering routines give up to 100,000 apparent colors on screen
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- Print, animate, transmit, store, or manipulate images with available IFF compatible programs
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"Digi-View sets new standards for graphics hardware"-*InfoWorld*

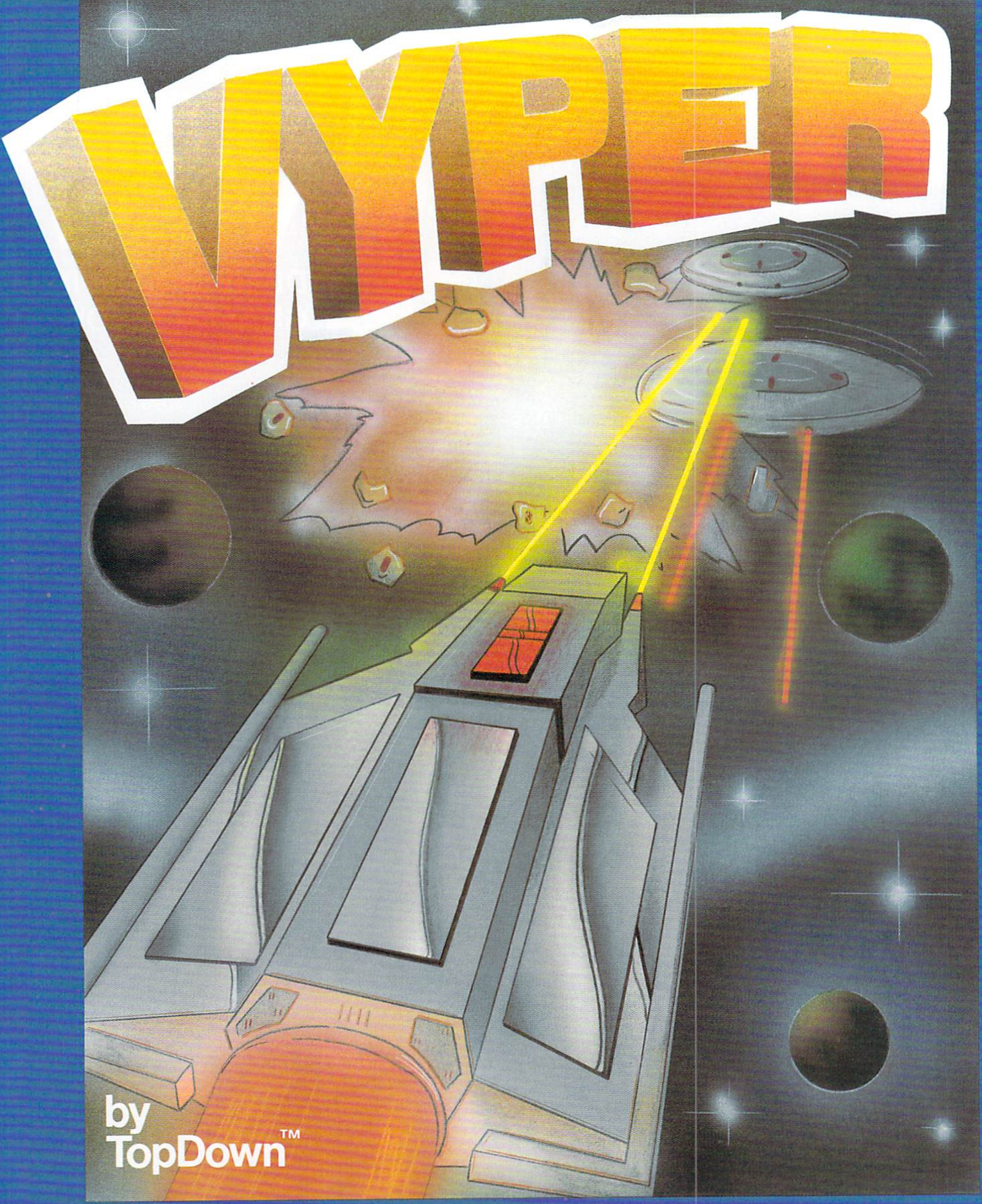
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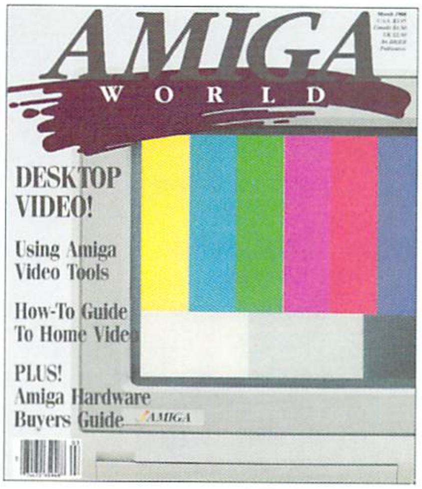


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VOLUME 4, NUMBER 3 MARCH 1988

CONTENTS



Potent possibilities for turning your Amiga into a viable video production system—on any level you're ready for! That's what we've got in store for you this month. How the professionals do it. How *you* can do it. What equipment, hardware and software, do you need? What's out there on the market? The Amiga is *the* desktop video computer, and you can harness its amazing graphics power to your needs. . . Plus our annual Hardware Buyer's Guide for *any* one looking for *any* thing to add *any* new dimension to the A500, A1000 or A2000.

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ZEITGEIST

"I have just one word

for you, my boy . . . video."

THE VIDEO ISSUE. While I was stumbling through my "career" working in factories, washing dishes, cooking pizzas, panhandling, juggling and even writing (writing paid the least, so naturally I chose a related field for a livelihood), I somehow managed to land a handful of jobs working at various cable and broadcast television stations.

If you want to learn about television, get a job at a cable TV station. They don't pay very well and they expect you to do everything from sweeping up at night to producing and directing shows. When I wasn't busy sweeping I wrote scripts, narrated, produced, directed and edited of a lot of memorable shows, like "This Week in City Council" and "Religious Perspectives."

I got pretty good at post production work, and eventually became the station's videotape editing whiz. I did most of the production and editing, so they let me order the equipment (an expensive habit). I had a lot of neat toys to play with for a while there.

I was looking at a professional video catalog last week and noticed one or two pieces of equipment that I used to play with. Prices have come down a bit since the early seventies. But nothing is cheap. Commodore (and *AmigaWorld*) has been saying that an Amiga can do the work of specialized video equipment costing thousands and thousands of dollars, and I wanted to check on how true that is. What I found was what I had expected. Here is just a sampling of the specialized video products you could pick up at your local professional video supply house.

JVC has a nice little titler (the M-1000) for only $2,325. It has a 640 × 200 resolution, a palette of 512 colors (four on screen at any one time) and 160K of RAM. You can get the advanced titling system (JVC M-1500) with a 640 × 400 resolution, one font in three sizes (other fonts optional), a paint program, mouse and some scrolling effects for a neat $4,995. Or you could get the titling and animation system (M-3000), which is almost as flexible as Graphicraft and not quite as flexible as Aegis Animator, all for $9,995. If you just want a video paint system, the Chameleon from Chyron, with 768 × 482 resolution, 256 colors out of 4,096 (where have we heard that number before?) does lines, circles, rectangles, color fills, custom brushes, etc. for only $11,900. Now, if you want to do simple animation with those images, you can get the Videofex SEG from Chyron, which works with the Chameleon, for an additional $14,000.

If you just want a character generator, you can get the Chyron VP-1 for $4,395; Convergence Corporation's VCG-75 is $1,250, and their VCG-750 is $2,995; Knox sells their Chromafont system in two configurations at $3,890 (four fonts—two upper and lower, two upper case only) and $5,780 (four extra fonts and other options); Micro-Tek has their Ernie for $3,995 and Max for $2,995; and Dubner makes three character generators with 5K, 10K and 20K for $9,500, $15,000 and $18,500 respectively.

I personally like the Texta video graphics generator and Turbo paint system from Dubner (one of the few systems with an optional digitizer). The Texta boasts 4,096 colors, hundreds of fonts, combines text and graphics on screen, 3-D animation, anti-aliasing and more. The basic configuration starts at $42,000 and goes up to $96,500 for the Turbo paint system.

Now I won't tell you that the Amiga can do everything that these pieces of equipment can. These are all specialized items that do their particular job better than the Amiga could hope to. Even if a character generator only has four fonts, it can put those four fonts on the screen better than an Amiga can. I didn't talk about SEGs (special-effects generators) that are much more expensive but can do things the Amiga can't (right now anyway). And I purposely left out complete lists of features, so don't complain that I didn't tell everyone the Texta can store 20,000 pages, or whatever. But this sampling of prices shows you why people in video are so interested in the Amiga.

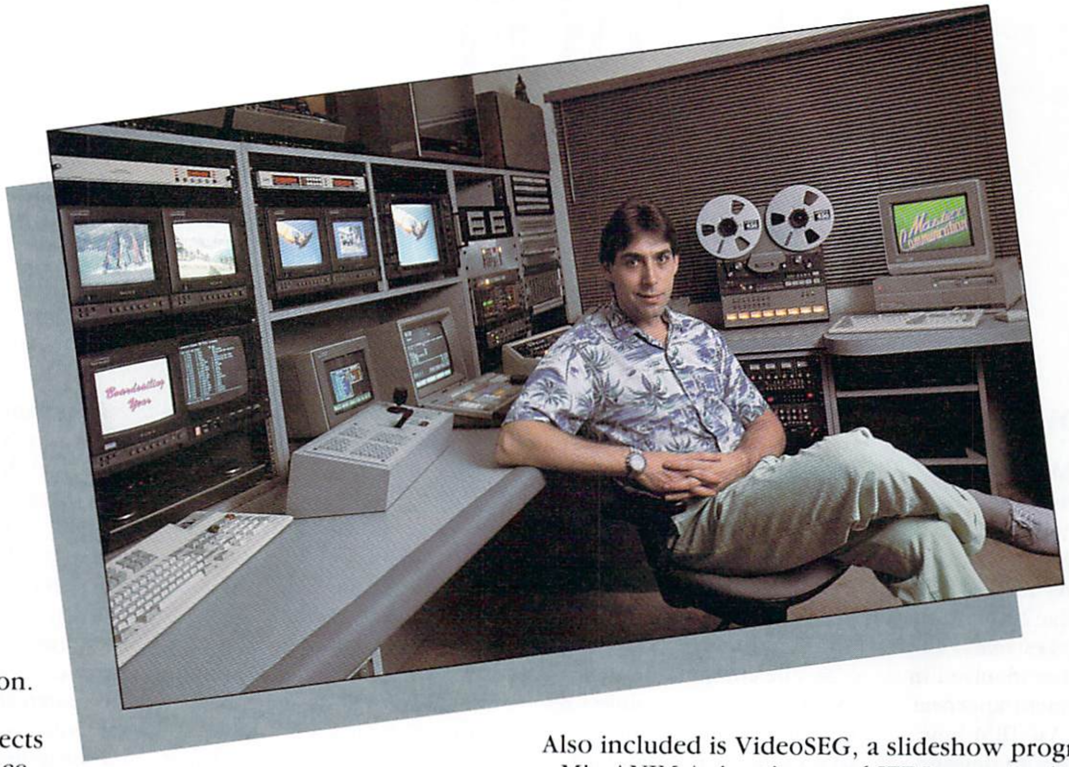
An Amiga, straight out of the box, can't do all of these things, but with the right equipment you can come close. And there are some things that the Amiga can do that no specialized video equipment can (like animated ray-traced images). There is a lot of confusion about the Amiga and video because the people who know about computers don't know about video and the people who know about video don't know about computers. Here is a simple get-rich scheme that I will give to anyone interested: Learn about both video and computers and you will be able to write your own ticket.

I hope this issue will put you on the road to understanding video and the Amiga. If you are planning to put titles on your latest network mini-series or vacation videos of Disneyland, you should find something here to help.

Maybe someday I'll be able to afford some of those expensive video toys, but until I win the lottery, I have the Amiga to play with, which ought to keep me busy for a few decades, at least. ■

Guy Wright

We Work with the Best



The best people.
The best equipment.
You'll find both at Master Communication. You see, Robert is a perfectionist. He expects maximum performance from his investment. That's why he has a switcher by Grass Valley Group, Digital Video Effects by Pinnacle, U-Matic SP and Betacam SP recorders with computerized editing by Sony, and high quality character generation by Dubner. But even a $20,000 character generator has its limits and when that's the case he turns to an Amiga and Aegis software.

Software like Aegis VideoTitler

VideoTitler turns your Amiga into a powerful titling workstation for video or graphic presentation. Here are just a few of the features you'll find.

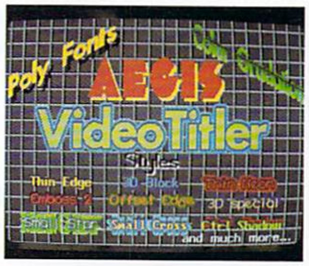
- 16 Colors in Medium and High Resolution
- 32 Colors in Low and Video Resolution
- Interlace, Overscan, Severe Overscan, and Halfbrite
- Support of Amiga, Zuma™ and Calligrapher™ Fonts
- PolyFonts for Distorting, Mirroring, and Manual Kerning
- Bold, Italic, Outline, and Drop Shadow in 8 Directions
- Left, Right, and Center Justification
- Color Gradation and 20 Different Styles Such as 3D Block, Thin Edge, Fat Edge, Outline Neon, Emboss, and Balloon
- Supports IFF, Also the ANIM Format for Creating Animated Titles
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Also included is VideoSEG, a slideshow program.

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REPARTEE

Comments, complaints and concerns from

AmigaWorld *readers.*

Smart Move

REGARDING MR. TARANGO'S comments [Repartee, Jan. '88, p. 8], the Amiga 2000 was not intended to be Commodore's answer to the IBM PS/2 and the Mac II. Hardware development takes years, as does the red tape involved in getting government approval for a product. Ask IBM how long it took them to develop and debug the PS/2. Commodore didn't just sit down and develop the A2000 to try to compete with the new IBMs and Macs. It was part of a smart move to diversify and expand the Amiga line. For those who needed or wanted PC compatibility and open architecture, the A2000 was the answer. PS/2 has not rendered MS-DOS obsolete. There is enough of a base for MS-DOS to keep it around for years to come.

Bryant Hayward
Collegedale, TN

Consider This

MR. TARANGO, WHO complained about the Amiga becoming a "technological laggard" ["Amiga 3000?," Repartee, Jan. '88, p. 8], is clearly misinformed. Granted, new offerings from IBM and Apple look good, but the Amiga 2000 has got them beat. Consider these facts:

1. The A2000 can support more memory than the Mac II.
2. 32-bit processing is only a matter of plugging in a relatively inexpensive board into the slot provided.
3. HAM graphics, overscan and super-bitmap features are still unique to the Amiga.
4. Amiga multitasking is here now, proven and built into ROM.
5. The competition charges extra for basic equipment requirements. For example, IBM's OS/2 is not standard equipment, costing anywhere from $300 to $800 extra. Also, it will not be complete until late 1988 (if then), and it does not include a windowing interface. IBM's mouse is also optional. And so are Apple's keyboards!
6. For the price of a new IBM or Apple, you can buy two or three fully configured Amiga 2000s.

Stewart Stevens
Santa Ana, CA

A "Valued Customer"

WHAT I FIND amazing about the debate over the Amiga 1000 is the void that exists because Commodore has not made a commitment to their customers. I finally took delivery of my A1000 in October '85, months after putting money down on it. I've paid peanuts for products designed for the Amiga and received impressive support—free, unsolicited updates, frequent status reports, even phone calls. But have I heard one single word, through any medium, from Commodore? No! Not one, even after spending the time to fill out, one by one, all the papers necessary to ensure that Commodore had the information it needed to keep in touch with a "valued customer."

If Commodore gave a damn, they might be a good company. The Amiga is a fine computer, but it can't do squat without the software and the people who use it.

Hank Lacy
Reston, VA

Brickbats & Bouquets

I HAVE A complaint about a continuing problem that I see no excuse for. That is the inability of much of the graphics software for the Amiga to fully support overscan. The Amiga's potential in video production is what sold me on this machine in the first place, especially after seeing demos of peripherals such as Live!, the video digitizer. But this product, aimed squarely at the video market, does not support overscan. Neither does another extremely popular video product, Digi-View. It's one thing for a paint program such as DeluxePaint not to support overscan in its initial release (although DPaint is useful for video production, that's not its primary purpose). But what about something like TV Text?

I own and use all the above programs (and many more), but I feel that they are worth only 10–25% of their potential because of this deficiency. Every graphics-oriented program that could be used in video production should incorporate overscan in its first release.

Enough of the brickbats, let me now toss a few bouquets to the programs such as VideoScape 3D, Pageflipper and The Director for properly handling overscan.

Robert Reiter
Emeryville, CA

Back Issues

I WOULD LIKE to suggest that you publish information on ordering back issues of *AmigaWorld.*

Steve Noling
Columbus, OH

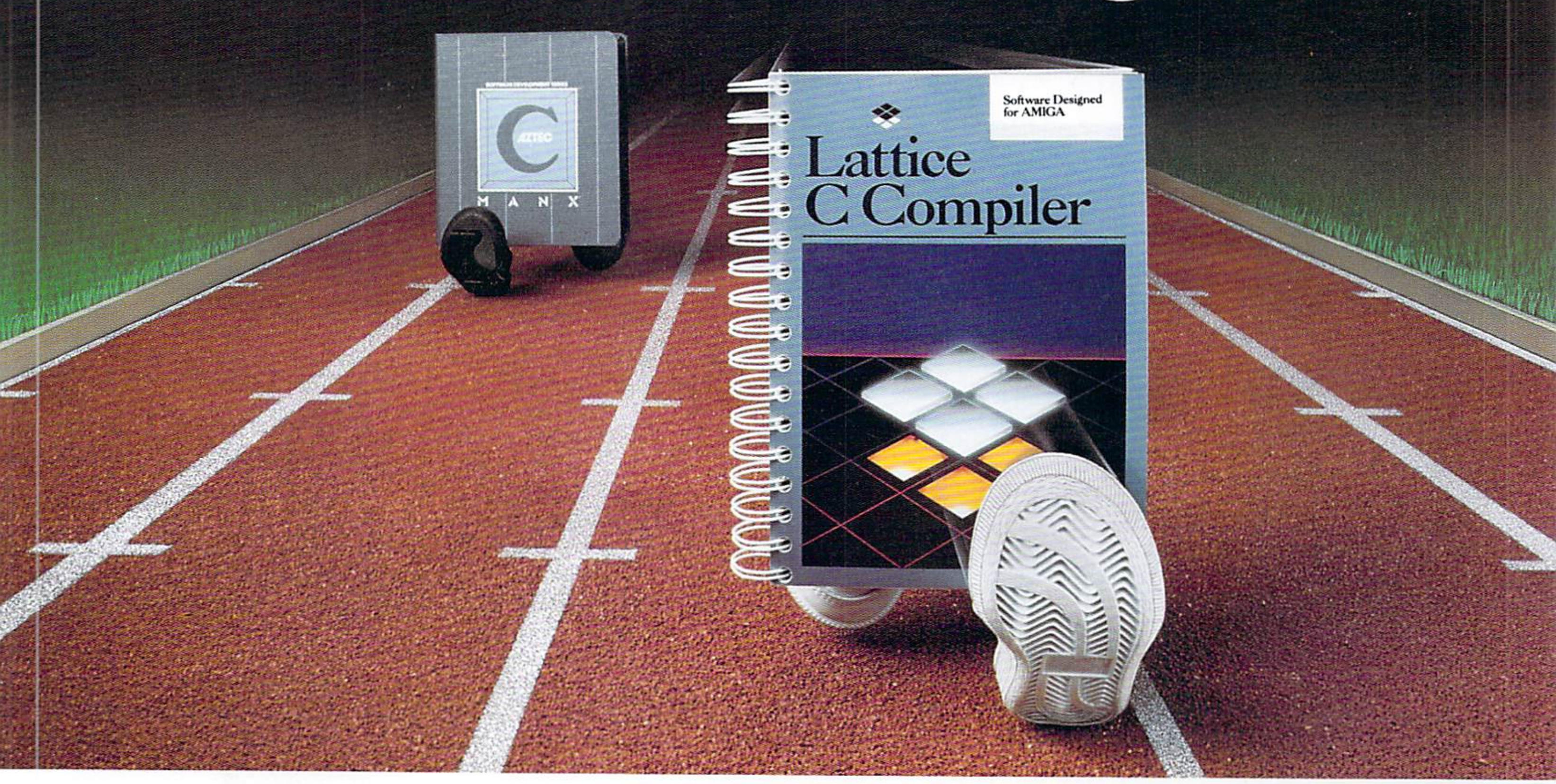
We occasionally publish ordering information for back issues (see the Jan. '88 issue, p. 88, for example).

Orders can be sent to AmigaWorld, *Attn: Back Issue Orders, 80 Elm St., Peterborough, NH 03458. Each back issue costs $4.50, plus $1 shipping and handling. On orders of ten or more back issues, there is a flat $7.50 shipping and handling fee.*

—Editors

Send your letters to: Repartee, *AmigaWorld* editorial, 80 Elm St., Peterborough, NH 03458. Letters may be edited for space and clarity. ■

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NOTEPAD

Edited by Linda Barrett

Look Who's A Big Boy Now



The bustling World of Commodore Show in Toronto.

THE AMIGA IS coming of age, and, like any teenager, it's making more noise and demanding more attention than any other machine in the Commodore family. When the family had a few guests over for a weekend party (The World of Commodore Show) last December, the precocious pubescent started showing off for company. Buttons and T-shirts shouted, "Seulement l'Amiga peut vous l'offrir!" (translation: "Only the Amiga makes it possible," the show was in Toronto) and "The Amiga 500, the computer for the best of us." The crowds attentively listening to demonstrations at the Commodore booth agreed.

Once a carefree gaming kid, the Amiga is now searching for a career. Show exhibitors were full of suggestions for a profession. Haitex Resources and Progressive Peripherals & Software thought design work might be profitable, offering their CAD programs, X-CAD (Haitex), IntroCAD (PP&S) and UltraCAD (PP&S) as evidence. An abundance of developers were full of good advice on entering the world of business. Progressive Peripherals & Software offered Superbase Professional. Abacus displayed Data Retrieve and TextPro. The Disc Company showed their word processor, Kind Words, while Oxxi played it by the numbers with Nimbus, a cash accounting package. Gold Disk and Infinity suggested the magazine business with their desktop publishing programs, The Professional Page and Shakespeare, each with a wealth of features geared towards heavy-duty page makeup. For the lighter side of publishing, Gold Disk premiered Comic Setter for designing comic strips. Zowie, it looked like fun. For the Amiga's creative side, Sound Quest stressed the world of music with a line of editor/librarian programs for the Roland, Yamaha and Casio synthesizers. The world of graphics was represented by Anakin Research (now with the Easyl for the 500 and 2000), NewTek (with further promises of the Video Toaster and an impressive demo of Digi-F/X) and A-squared (who digitized every Live! object in sight). Very Vivid was very visable with The Mandala, the interactive live video system that gives new meaning to the user-friendly interface. Airware Solutions sent the Amiga out into the stratosphere with AWS-1000, the airline pairing generation system. To have room to match up all those pilots, planes and fuel, the Toronto show offered plenty of hardware add-ons, including Supra's new hard drives for the 500, Comspec's auto-booting hard drive and Spirit's internal memory boards.

All work and no play makes the Amiga a dull computer, so there was a toy box full of new games demonstrated as well. Discovery was knocking through the walls of a time warp with Arkanoid at one end of the galaxy, while at the other Vertex was shooting everything in sight with Quasar. Also seen running wild in the Vertex booth, was a round yellow creature with a large mouth, going by the name of Footman. Across the hall, Electronic Arts was still driving in circles, promising the release of Ferrari Formula-One Racing.

Overall, the Amiga's act was received with enthusiasm (except for the 1:00 am firedrill at the show hotel). Judging by the number of complete A500 and A2000 systems that were wheeled out the door with sales slips flapping, the small but dedicated group of disciples is becoming a large but dedicated group. Our little computer is growing up.

—LJB

The Search for Intelligent Life

AGNES ANGST WANTED—*needed*—noise, over 20 different noises. So, the A2000 was put in charge.

When Lily Tomlin's one-woman show *The Search for Signs of Intelligent Life in the Universe* open in San Francisco last December, it marked the debut of new concept in sound production for a traveling theatre company: an automated sound console built around the Amiga 2000. The play (which won Tomlin a 1986 Tony for Best Actress) relies on an extensive array of sound effects to supplement her superb characterizations (Agnes, the angry punk rocker; Trudy, the wise bag lady with the umbrella hat that tunes her into the minds of others, and all those Trudy connects with). In all, the show features well over 300 sound effects, which must be perfectly synchronized with Tomlin's 90-minute performance.

Debby Van Poucke, sound designer for the show, developed most of the sound effects. According to Van Poucke, "The sound is the third partner in the show. The first partner being Lily and her characters and the second being Jane Wagner, who wrote the show. All of Lily's mime movements are accompanied by special sound effects." As Tomlin's movements became so tightly woven with Van Poucke's effects, Van Poucke found it nearly impossible to handle the show's sound on a consistent basis, so they decided to convert to Richmond Sound Design's Amiga-based Command/Cue 4096 Automated Control System.

The Command/Cue system can automatically execute sound and visual effects cues and control 4,096 faders (similar to, but more sophisticated than, the volume controls on a stereo) and 8,000 hardware devices (tape decks, CD players, video equipment). To visually track the cues, the Command/Cue system displays an image of how the sound console would look like if it physically existed. With the multitasking Amiga as its brain, the system can perform more tasks more quickly than any manually-operated board possibly could. As the system's designer Charles Richmond explains "With this system, you can have three cues go within half a second, ten cues in one second, and every cue can change the status of all 4,096 faders, just like that."

The Amiga-Command/Cue automates all aspects of the Tomlin show's sound system; using a technique that Richmond describes as "distributed intelligence." "There is no computer I know of that is capable of calculating what volume level each of the 4,096 faders should be at for every point in time," Richmond says. "The way we have gotten around this is through the use of distributed intelligence. Some of the devices on our boards receive data from the software and store it in on-board memory until they receive new instructions. Other types of devices have an on-board microprocessor that runs a program stored in it when the software instructs it. For example, the Amiga can send an instruction to microprocessor-controlled fader that says 'initiate a fade to this level at this rate.' The microprocessor then executes the command all on its own and the Amiga can move on to the next task."

The Search for Signs of Intelligent Life in the Universe is aided by a Command/Cue system consisting of two Amiga 2000s (one for back-up) and three rack-mounted card cages, each holding 16 four by five-inch circuit boards. The boards contain several hundred faders and discrete sound channels, which enable Van Poucke to generate sound effects from speakers placed throughout the theatre without having to constantly punch buttons, throw switches and twist knobs. As Van Poucke says, "We try to deal with very specific locations of speakers in the house, trying to give a dimension of location wherever she is on stage".

Lily Tomlin's show is putting the Command/Cue system through a true acid test, and it is passing with honors. Van Poucke: "This system has been a rock. It has moved well, it has done well, it has worked well. The Amiga computer has done extremely well." Crank up the tunes, Agnes.

—Michael Brown

The Master Bedroom

AN AMIGA 2000, a Pinnacle DVE 2010 special effects generator and a Dubner 10K character generator are standard equipment for a bedroom—at least Robert Masters' bedroom. Formerly a designer of professional audio studios, Robert Masters shouldered a rented camera and converted to video in 1985. His first production, "Boardsailing 1986," netted him a showing on ESPN, a host of accounts and his own ¾-inch Betacam and SP professional online video production house, Master Communications. To map the mile and a half of cables connecting the audio, video and special effects equipment, Masters designed his quarter million dollar video bedroom on the Amiga, using Flow (New Horizons) and Aegis Draw Plus.

Masters and partner Mary Jo Milan use the Amiga for scripting, billing, graphics and animation for customers like the Bahamas Tourist Board, Corona Beer, Suzuki Motor Corporation and Commodore. He says,"At first we only planned to add a paint system if we could have a $50,000 Cubicomp or at least the $15,000 DPS-1 upgrade for the Dubner. But we found that the Amiga is perfectly appropriate in certain situations. You don't always need great resolution or large color palettes. People often ask if I drew our graphics on a Bosch or a Cubicomp; when I tell them I used a $2,000 computer, they don't believe me."

The Amiga proved a price-performance leader when Foster's Freeze Corporation needed a map of Saudi Arabia with an image of Little Foster on it. Generating just one screen on a Cubicomp would have cost around $3,000; instead, Masters used the Amiga to deliver eight maps, three variations of Little Foster and a series of pie charts for one third of the price. Masters adds, "And the client didn't give up anything at all. The style of graphics we chose to use wouldn't have looked any better on a Cubicomp. If you can't see the difference, why spend it?"

Clients who have Amigas themselves can see the difference. Marketed for the video professional, the Edit Decision List Processor (EDLP, Prism Computers) will generate a complete edit decision list. With the EDLP, clients can store and recall all of of the cuts, fades and dissolves in a video on their Amiga, then transfer the data to Masters' system by disk or modem for a completely automated assembly that is much faster than compiling the video by hand. Masters says, "The EDLP saves the client time, and time is money squared in video. An Amiga owner can be more competitive, by producing a better show for less money."

—Ben and Jean Means

HORS D'OEUVRES

Hints, tips and techniques

from your fellow Amiga users.

COLOR VIEWGRAPHS

I HAVE DISCOVERED another great feature of the Okimate 20 and would like to share it with other Amiga users. One day, I was staring at the Okimate's ribbons and noticed that they were transparent. I printed a color IFF file on transparency film and voila!—color viewgraphs! (If you're afraid of trying just any film on the Okimate 20, try using Scotch 3M 7101 Clear Transparency film for infrared copies, part no. 021200-16820.) This only works for thermal-transfer printers.

Frances Koo
Los Angeles, CA

LARGE BASIC UPDATE

THE SPECIAL ISSUE tip ("Big BASIC Programs Loader," p. 100) about using a "loader" program to run BASIC programs larger than 25K was a godsend. The example given, however, will not work if entered exactly as listed. Here's the loader I use, which does work:

```
CLEAR ,25000
CLEAR ,140000
LOAD "drawername/mainprogram" ,R
```

This loads and runs the 140K program mainprogram, found in the drawer drawername. If you don't want it to run automatically, just leave off the " ,R".

Steve Tiffany
San Francisco, CA

ED CUE CARDS

FOLLOWING J. NAKAKIHARA'S suggestion (Hors d'oeuvres, Jan/Feb '87), I created a single-screen cue card in ED for the screen editor keyboard input (i.e., which keys do what). Having edited the startup sequence of my CLI disk (stripped of Workbench and its icons) to create a RAM disk (see *AmigaWorld*, May/June '86 or the *AmigaWorld* Special Issue '87), I added the following to the end of the file:

```
WAIT 5
TYPE SYS:Edhelp
NEWCLI "CON://640/200/Work Area"
```

This fills the CLI screen with my cue card for ED and then creates a full-sized NEWCLI to use as a work area (labeled as such). This way the screenful of information isn't scrolled off, and, with a click on the ED and "Work Area" depth gadgets, is immediately available. This obviously would work for any text that you might want to have always at your fingertips. Just be certain that the information will fit onto a single screen.

Marilynn Boosinger
Willits, CA

RAM RENAMING

WHEN YOU HAVE files on a floppy or a hard disk, AmigaDOS won't let you "RENAME fileA as fileB" if fileB already exists. But in a RAM: disk, you can end up with two files named fileB! As nearly as I can tell, further references to fileB act upon the fileB, which used to be fileA. Got that?

Adam Levin
Piermont, NY

PRINTING BASIC GRAPHICS

ARE THERE ANY Amiga users out there who don't like typing in the instructions for printing Amiga Basic graphics? Could there be people out there who just plain don't know how to print graphics from BASIC? There is a simple solution. You just need Workbench 1.2 and, of course, a printer.

First of all, open the program that has the graphics you wish to print. Then run the program. When the program finishes putting the graphics on the screen, open Workbench, then open the drawer labeled System. There you will see an icon named Graphicdump. Double click on this, and while the program is loading (you have about 10 seconds), move your cursor and anything else you don't want printed off the screen so that only your BASIC graphics show (anything else will be printed too). The Amiga will start printing your screen in a few moments.

Marc Hoffman
Julesburg, CO

DISKDOCTOR UNDELETE

WHILE TRYING TO "heal" one of my many corrupt disks with the Diskdoctor command (on Workbench 1.2), I noticed that Diskdoctor not only recovered (or at least attempted to recover) files on the corrupted disks, but it also recovered deleted files as well. To recover a deleted file, just follow the directions given in the Enhancer Software Update manual (with the exception that it will not be necessary to copy the files to another disk when finished). If all goes well, your deleted file should be back. I've tried this many times and have found it to be a fairly easy, not to mention inexpensive, alternative to buying a commercial product that does little more.

Adam Boyle
Boise, ID

Editor's Note: Testing this tip, we found that Diskdoctor doesn't always "undelete" files. Talking to Commodore, they said that they didn't know why it worked sometimes and not others (we think it is because Diskdoctor reads then writes to the disk it is working on, sometimes writing a different file over the deleted ►


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file before it gets to the deleted file), but Diskdoctor wasn't designed to recover deleted files, so don't blame Commodore if it doesn't work. There is a public domain program, Disksalv (on Fred Fish disk #20), that will attempt to recover just about everything on a disk. Disksalv will even salvage some disconnected blocks of a program, giving them generic names so you might get back some, if not all, of a file even if you have written to the disk in question after the delete. The best advice is: Once you have deleted a file that you want to recover, DON'T DO ANYTHING to that disk until you try Disksalv or a commercial undelete program (if you can find one), or (as a last resort) Diskdoctor.

Hidden Messages

SO YOU THOUGHT the Amiga developers had a sense of humor in naming the Guru Meditation errors? Check out the hidden messages in Workbench.

1. From Workbench, press all four shift and alt keys at the same time with the edges of your thumbs.
2. While holding down these four keys, press the F1 key (with your nose, I guess). You will see a message in the title bar of the Workbench screen. Each function key will display a different message.
3. Once you have gone through all the messages, go back to holding the four shift and ALT keys and the F1 key and simultanously pop the disk out of the drive (with your third hand). You will see another message.
4. The final Workbench message comes when, while still pressing everything, you pop the disk back in the drive. This last one only stays on the screen for a second, so watch carefully.

There is also a hidden message in the Preferences program, though a little more difficult to extract. To see it, try the following:

1. Start the Preferences program.
2. On the right side of the screen there are two gadgets that look like your mouse. Call them ML and MR (mouse left and mouse right).
3. Move your pointer to ML and click on the picture of the left button, then the right button.
4. Move your pointer to MR and click on the picture of the left button, the the right button.
5. You should have clicked four times (ML left, right; then MR left, right).
6. Repeat these four clicks three more times, bringing the total to 16 clicks.
7. Now move down and click the Change Printer box.
8. Select the Serial Printer gadget in the upper left.
9. Now go over to the right and click the up-arrow gadget twice (normally used to cycle through the printer selections).
10. You should now see a romantic message in the drag bar of the Preferences window. If you don't see the message, then cancel, back out and start over again.

Charles Jagow
Chesapeake, VA

If you have an idea you'd like to share with our readers, send it to AmigaWorld *Hors d'oeuvres, 80 Elm St., Peterborough, NH 03458. If your idea gets published, you'll receive an* AmigaWorld *T-shirt for your efforts. (Don't forget to tell us your T-shirt size.)* ■

BASIC By The Numbers

The weather is "variable" in Part III of our tutorial on Amiga Basic, but there are "arrays" of mitigating factors on the horizon.

By Bob Ryan

15 Type Casting

FOR THE MOST part, data used in Amiga Basic programs is stored in variables. Variables refer to distinct locations in your computer's memory that you access by using the variable's label or name. Therefore, variables have two components, a name and a value. The value is the contents of the storage location.

Amiga Basic can store five different types of data: short integers, long integers, single-precision real numbers, double-precision real numbers and strings. Consequently, Amiga Basic has five different variable types to hold the different data types. Short integers are whole numbers (no decimal points) between −32768 and 32767. Long integer variables can hold longer whole numbers (−2147483648 to 2147483647) but require more memory (four bytes versus two for short integer variables). Double-precision real variables—also called floating point variables—can hold values from 2.23×10^{-308} to 1.79×10^{308}, while single-precision real variables can hold values from 1.18×10^{-38} to 3.4×10^{38}. Single-precision real variables require four bytes of memory, while double-precision reals require eight bytes. String variables store one character per byte, with a five-byte overhead regardless of the length of the string.

You tell Amiga Basic which type of variable you are using by special extensions tacked onto the variable name. Here is a list of the extensions:

Type	Extension	Examples
Short Integer	%	count%, x%
Long Integer	&	total&, num1&
Single Precision	!	rabbit!, george!
Double Precision	#	howdy#, doody#
String	$	address$, ballot$

Note that the extension for single-precision real variables is optional; if you do not put an extension onto a variable name, the variable will be a single-precision real.

If you don't know a double-precision real number from King Kong, don't worry about it; you can program forever using only single-precision real numbers and strings.

So why did Microsoft bother with the other variable types? Quite simply, there are instances when you need the extra precision of double-precision real numbers or the speed of integers. If you are just learning, however, you can ignore the weirder variable types until you get more comfortable with programming.

By the way, if you use a numeric variable in a program without first assigning a value to it, the variable takes a value of zero. String variables get set initially to null.

16 Anchors Array!

THE VARIABLE TYPES described above are simple variables—each variable name refers to a single variable. Amiga Basic also supports a type of data structure that lets you access many related variables with a single name. This data structure is called an array. To get a feel for arrays, try the following program:

```
REM First Array Program
  DIM name$(4)
  name$(0) = "Smokey Joe Wood"
  name$(1) = "Dick Radatz"
  name$(2) = "Jim Lonborg"
  name$(3) = "Babe Ruth"
  name$(4) = "Sparky Lyle"
  FOR x = 4 to 0 STEP -1
    PRINT name$(x)
  NEXT x
END
```

The first line of the program instructs Amiga Basic to set up an array. The DIM statement indicates that this line is an array declaration, name$ is the name of the array (the $ extension indicates this is an array of string variables), and the number 4 indicates the last or highest possible variable in the array. Because the numbering of array variables (better known as array elements) begins with 0, the 4 indicates that the array has five elements numbered 0 through 4.

Once you declare an array, you can begin using it. The next five lines of the program assign different values to the different array elements. Note that name$ is used to refer to ►

all the array elements; the subscript (the number between the parentheses) indicates which element of name$ is being referred to. After all the assignments are made, the FOR. . .NEXT loop prints out the contents of the array. Note that the array subscript does not have to be a constant; it can be a variable that you calculate elsewhere in the program. The subscript, however, must be a whole number.

(When you run the program, you will notice that the FOR. . .NEXT loop prints the array starting with the last element and ending with the first. This is because I got tricky and used the optional STEP component of the FOR statement. See pp. 8–54 of the Amiga Basic manual for an explanation of STEP.)

Arrays can save you a lot of typing. Let's say you needed to analyze test scores for a class of ten students. Instead of using ten separate variables (named perhaps score1 through score10), you can create a single array named score that has ten elements. Compare the following program fragments that add the ten scores. Which one is easier?

Fragment 1.

```
total = score1 + score2 + score3
  + score4 + score5 + score6 +
  score7 + score8 + score9 +
  score10
```

Fragment 2.

```
FOR x = 1 to 10
  total = total + score(x)
NEXT X
```

Now imagine that the class has 40 students, or 400. Or, imagine that you have to analyze scores from thousands of students in an entire school. Thank goodness for arrays.

Arrays should consist of a series of related variables. The first reader to drop me a line identifying the relationship between the elements of the array in the sample program will win the Amiga game of his or her choice. Send your answer and the name of the game you want to BASIC By The Numbers, *AmigaWorld*, 80 Elm Street, Peterborough, NH 03458. I'll identify the winner in a future column.

17 New Dimensions in Arrays

THE ARRAY I created above is called a one-dimensional array: It consists of a linear series of elements that you access with a simple subscript. Amiga Basic arrays are not limited to one dimension; you can have arrays of up to 255 dimensions. Practically speaking, however, a two-dimensional array is probably the largest you will ever need.

In algebra, a two-dimensional array is called a matrix, which is used to do a lot of algebraic things that I haven't thought about since high school. (If you need to do algebraic things with matrices, you should consider purchasing True BASIC, which contains many matrix manipulation commands.) Two-dimensional arrays are also useful in other areas, such as creating databases and spreadsheets. In fact, the column and row arrangement of a spreadsheet is a perfect example of a two-dimensional array. I'll look at two-dimensional arrays more closely when I deal with using data files from Amiga Basic.

18 Variables From Planet X

MOST OF THE numbers you work with in programs are either input from the keyboard or a data file or are calculated within the program. Sometimes, however, you do not want to predetermine the output of a program by determining the input. Many programs, especially games, require the input of random numbers.

Amiga Basic has a built-in random number generator. You access it by using the RND statement. RND is a built-in function that returns a number between 0 and 1. For instance, num1 = RND will put a number between 0 and 1 into the variable num1.

The RND function can also use optional arguments that affect the number the function returns. For example, if you specify an argument of zero for the RND function—num1 = RND(0)—then the RND function will simply repeat the last number it generated. If you specify a negative argument—num1 = RND(−6)—the random number generator will restart a set series of numbers depending upon the value of the argument. Positive arguments (or the lack of an argument) result in a seemingly random series of numbers.

To experiment with the RND function, try the following programs:

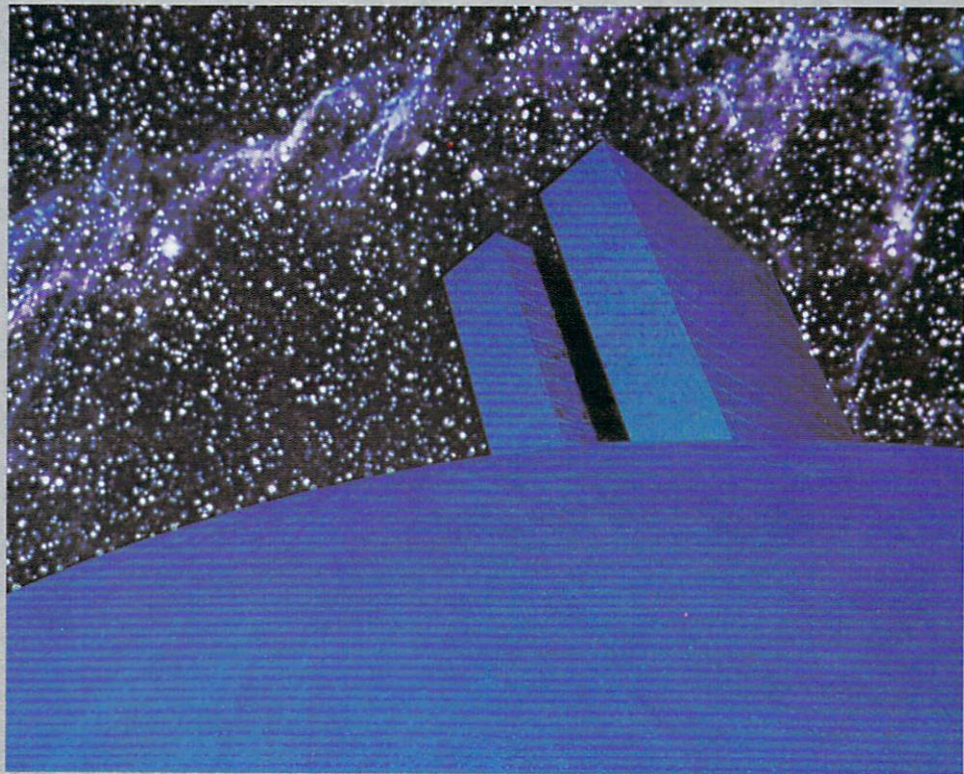
```
REM Random Numbers
REM Negative Argument
  num1 = RND(-1)
  FOR x = 1 to 5
    num1 = RND
    PRINT num1
  NEXT x
  PRINT
  num1 = RND(-1)
  FOR x = 1 to 5
    num1 = RND
    PRINT num1
  NEXT x
END

REM Random Numbers
REM Zero Argument
  test = RND
  FOR count = 1 to 10
    PRINT RND(0)
  NEXT count
END

REM Random Numbers
REM Positive Argument
  FOR z = 1 to 10
    PRINT RND(1)
  NEXT z
END
```

When you run the first program, you will notice that the second series of numbers is exactly the same as the first. The second program gives you ten identical numbers, while the third gives you ten different numbers. Negative and zero arguments are useful when you are testing programs that use random numbers. For the most random results, however, stick with positive arguments or no argument at all. ►

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19 Dicey Situation

IF YOU RUN the last program in the previous section several times, you will notice that you get the same numbers each time you run the program. To keep from repeating the same series of numbers whenever you run a program that uses the random number function, you have to "seed" the random number generator. This is the function of the RANDOMIZE statement.

```
REM Randomize Statement
Start:
  PRINT "Enter a number between
  INPUT " - 32768 and 32767" ;seed
  RANDOMIZE seed
  FOR z = 1 to 10
    PRINT RND
  NEXT
END
```

You will get a different series of random numbers everytime you run this program, as long as you supply a different seed for the RANDOMIZE statement. To avoid having to enter a seed from the keyboard, you can have the Amiga supply a seed as follows:

```
REM Timer Seed
  RANDOMIZE TIMER
  FOR counter = 1 to 10
    PRINT RND(1)
  NEXT counter
END
```

The RANDOMIZE TIMER statement seeds the random number generator with the number of seconds since midnight. This is the best way to generate random numbers on the Amiga.

20 Lucky Seven

BECAUSE RANDOM numbers are all between 0 and 1, you must massage them to fit your needs. Let's say you want to simulate the roll of a pair of dice. Each die can return a value from one to six. Getting appropriate values from the random number generator requires some tweaking.

```
REM Roll 'em
  RANDOMIZE TIMER
  PRINT "First die: ";
  die1 = 1 + INT(RND * 6)
  PRINT die1
  PRINT "Second die: ";
  die2 = 1 + INT(RND * 6)
  PRINT die2
  PRINT "Total:"; die1 + die2
END
```

Let's look closely at line 4. The first thing that Amiga Basic does when it executes this line is perform the RND function call. It then multiplies the random number by 6. As the random number is between .000000000000001 and .999999999999999, multiplying it by 6 gives you a number between .000000000000006 and 5.999999999999994. Next, the INT function chops off the decimal part of the number, leaving a number between 0 and 5. Adding 1 results in a random number between 1 and 6. You're now ready to write your own craps game!

Save this example of extracting a usable value from the random number generator using multiplication and the INT (INTeger) function. By changing the multiplier, you can get random numbers between any values.

21 Dotty Demo

YOU HAVE PROBABLY run the Dots demo that comes on your Workbench disk. Now you can write your own using the RND function and the simplest Amiga Basic graphics command, PSET.

To program graphics on the Amiga, you need to know a little about the coordinate system used to plot graphics. For now, I'll limit this discussion to graphics using the standard Amiga Basic output window. I'll discuss custom screens and other colors later on.

The Amiga Basic output window is 640 pixels (picture elements) wide and 200 pixels wide. The PSET command sets a pixel you specify to one of the four Workbench colors. You specify a pixel by specifying its coordinates. Pixel (0,0) is the upper left corner of the window; pixel (639,199) is the lower right corner. (Notice that the coordinate numbering system begins with 0, not 1.) The first coordinate is the horizontal column; the second is the vertical row. Thus, PSET (320,100) 1 sets the pixel at column 320, row 100 to color 1.

In the standard output window, color 0, the background color, is blue. Color 1 is white, color 2 is black and color 3 is orange. You can now write your own Dots demo. Here's a sample Dots demo:

```
REM BASIC Dots Demo
RANDOMIZE TIMER
Loop:
  x = INT(RND * 640)
  y = INT(RND * 200)
  colornumber = INT(RND * 4)
  PSET (x,y), colornumber
GOTO Loop:
END
```

This program will put dots onto the screen until you stop it. The Dots demo on the Workbench may be faster, but you can get the same results from Amiga Basic.

22 Homework

THERE ARE THREE other programs in the Demos drawer of the Workbench disk. Check your Amiga Basic manual and see if you can figure out how to use the Amiga Basic LINE, LINE with box fill and CIRCLE commands to duplicate the Lines, Boxes and Spots demos. I'll give you the listings next time.

If you have any questions or comments, write me at BASIC By The Numbers, AmigaWorld, *80 Elm Street, Peterborough, NH 03458.* ■

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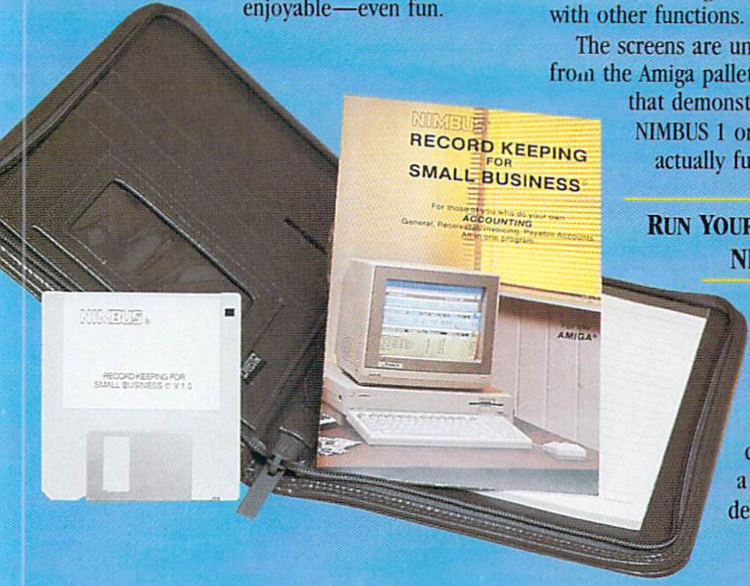
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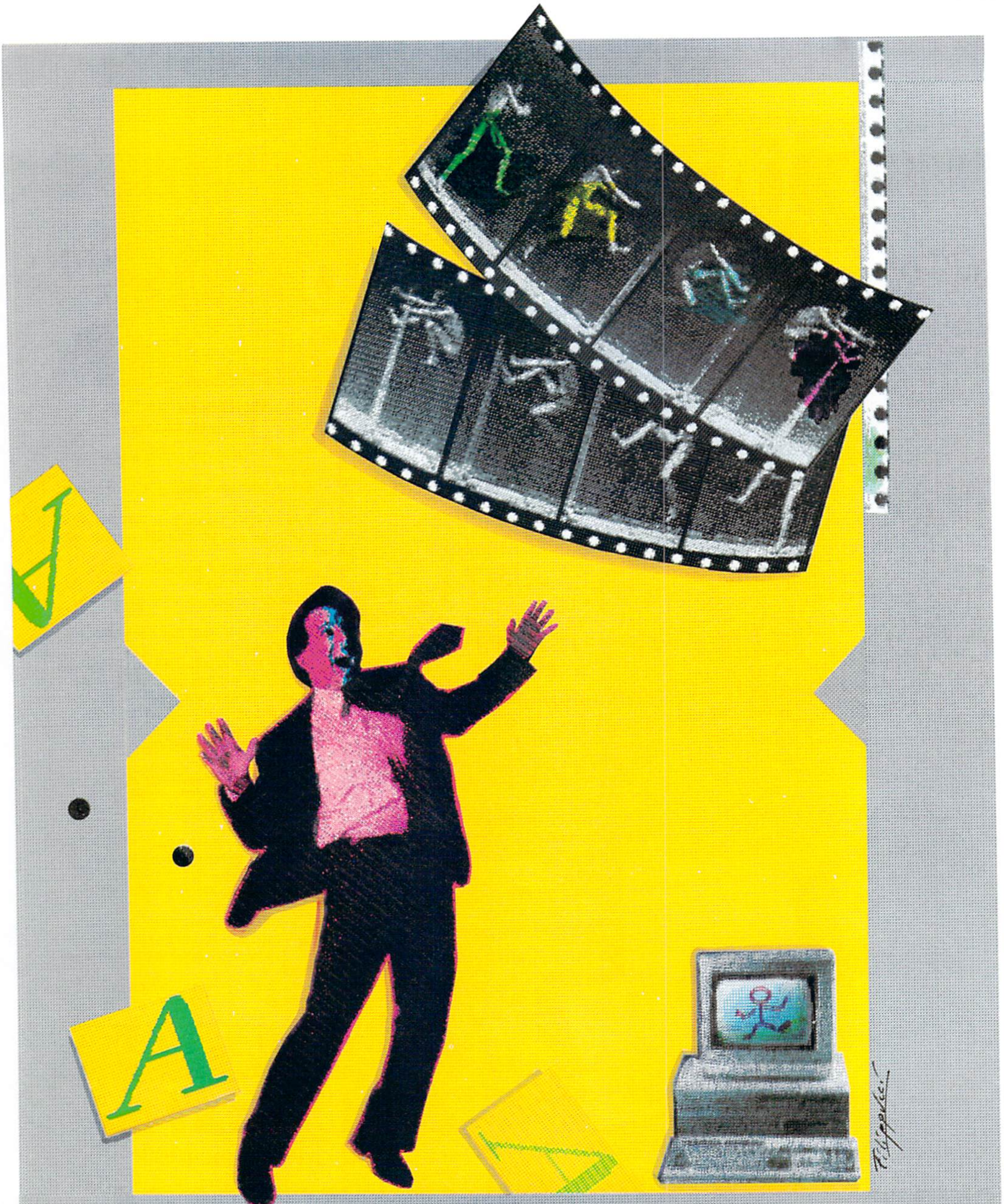
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AMIGA WORLD INVENTORIES THE SUBSTANTIAL STOREHOUSE OF HARDWARE AND SOFTWARE TOOLS AVAILABLE TO TURN YOUR AMIGA INTO A STATE-OF-THE-ART GRAPHICS ANIMATION SYSTEM.

By Wayland Strickland

VIDEOT'S DELIGHT

WITH THE ADVENT of desktop video, many of Hollywood's most dazzling special effects tricks can now be achieved with personal computers. Developers are releasing new video-oriented hardware and software that taps the Amiga's graphics and animation capabilities. Amigas are now being used as graphics animation workstations in both home and professional environments. Whether you're an amateur or professional videographer, you now have access to the tools you need at affordable prices.

The following is an overview of products (both software and hardware) that can transform your Amiga into a state-of-the-art graphics animation system.

SOFTWARE

CHARACTER-GENERATING PROGRAMS

CHARACTER GENERATORS are used in literally every production on television today. Broadcasters use them for many different functions, such as the scrolling of information on a monitor in front of a newscaster (teleprompter) or placing ordering information at the end of a product advertisement. Simply put, a character generator is a device in which text is created and placed in the form of titling and other information onto video. The Amiga, with its ability to genlock to an external video source, is an ideal character generator. Hence, the Amiga can be put to work just as easily in a broadcast control room as it can at home.

PRO VIDEO CG1. PVS Publishing's Pro Video CG1 character-generating software includes nine resident fonts that can all be used at the same time (in one of 16 colors) out of 4,096 total colors. Each line of text can be designated a certain style of drop shadow out of an available 13. It also demonstrates a one-hundred►

ILLUSTRATED BY SANDRA FILIPPUCCI

page capacity of stored text in RAM for instant retrieval. Page and screen transitions include rolls, reveals, pulls, wipes, slides, checkerboard and crawls at numerous speeds and dwell times. A PAL version of this program is also available.

PRO VIDEO PLUS, also from PVS Publishing, contains the same extensive features of Pro Video CG1, but with the addition of seven internal fonts, plus graphics. The most requested addition incorporated into this program is the ability to use IFF pictures as backgrounds so that text can be overlaid. More than 48 screen transitions including rolls, crawls, slides, wipes, reveals and line-independent moves have been incorporated, also. This program, similar to its predecessor, is memory dependent, requiring at least one megabyte additional fast RAM.

VIDEO TITLER from Aegis Corporation is another character-generating package that performs both character-generating functions as well as special effects. The program operates in 16-, 32- and 64-color modes (using HALFBRITE). Up to ten fonts at a time can be assigned to function keys for easy access. In addition, in the expert mode, fonts can be modified for various effects. Video Titler also has a special-effects mode for various wipes and display changes. The ANIM format for compressed animation is supported, along with true overscan (768 × 480) to round out the list of accomplishments.

TV TEXT *AND* TV SHOW, developed by Brown-Wagh Publishing, are two programs that work together (sold separately) to create and perform special titling. TV Text generates titles from any of nine video fonts available, while TV Show can fly in or out and wipe on or off the titles generated from TV Text or IFF brushes in front of any IFF background.

About Overscan

DESKTOP VIDEO WOULD not be possible without overscan. Although not listed as a standard Amiga feature, overscan allows a program to fill an entire video display screen. Unfortunately, there is no standard set for this feature. For example, VideoScape 3D uses 352 × 440 as its interlaced screen size, which leaves the bottom 20 lines of most monitors black. This makes it difficult or sometimes impossible for it to be used for professional applications. (Aegis is aware of this problem and has promised to fix it in the update.) DeluxePaint II has a similar problem in its high-resolution mode. Using 672 × 444 creates borders on the outside of the image, making the program undesirable for broadcast use.

The ideal sizes, which some software is currently using, are 384 × 480 interlaced and 768 × 480 in the high-resolution mode. However, with character-generating software, this is not a problem. Character generators have a feature known as "safe title area", which is set up so that characters will not be printed off the side of the screen. So, in this application, the overscan at 672 × 444 is acceptable, but with paint and animation software it sometimes severely limits its usefulness. □

—WWS

STATION MANAGER SERIES. The last of the character-generating programs to be mentioned here are actually part of a complete package from Associated Computer Services. However, each is sold separately. The first in the series is Station Manager/Character Generator, a full-featured character-generating program. Station Manager/Teleprompter is a broadcast-quality teleprompter emulator ideally suited for newscast use. Station Manager/Weather Graphics generates weather graphics screens for television stations in addition to downloading weather information automatically from local weather service bureaus.

3-D Rendering/ Animation Programs

TODAY, 3-D GRAPHICS are everywhere: in network promotions, sports coverage, commercials, movies, etc. With the recent release of various 3-D rendering and animation programs, each with their own special capabilities, the power of 3-D animation is now within the reach of personal computer users. Due to the complexities of animation and the amount of RAM required, the manufacturers of these products recommend at least one megabyte of fast RAM.

SCULPT 3-D from Byte by Byte uses a method known as ray tracing to achieve realistic object textures and shading. Ray tracing is a method whereby one or more light sources are assigned to a specific point while the computer traces each "beam" of light to its conclusion. Sculpt 3-D can create many textures, from smooth crystal to a bumpy armadillo shell. Sculpt-3D works in the HAM mode and supports overscan (704 × 480). It should be noted that this rendering program has no animation capabilities. Sculpt 3-D is not copy protected and can be used with a genlock.

ANIMATE 3-D, also from Byte by Byte, can import objects created by Sculpt 3-D or create its own. Animate 3-D lets you control movement of lights, camera and, of course, objects through a graphic interface or through a simple script language. IFF images can be used as foregrounds and backgrounds while objects are animated in the middle of the two. Animations can be previewed in either a wire-frame mode or stored as a compressed animation file similar to the anim format, or stored into a frame buffer for display. Animate 3-D is not copy protected and supports both overscan (704 × 480) and a genlock.

SILVER from Impulse Inc. is another ray-tracing animation program. It combines the functions performed by Sculpt 3-D and Animate 3-D in one package. Although not as mathematically sophisticated as Sculpt 3-D, Silver is faster rendering images. ►

NTSC Video Made "Easy"

REMEMBER BACK IN the '50s, sitting on the living room floor with a bowl of popcorn, watching Ozzie and Harriet or Milton Berle? Black-and-white TV was great, much more exciting than radio, but still there was something missing. Color.

The engineers got together, and after the expected arguments, committee meetings and failed attempts, a standard was finally reached. It was compatible with the existing black-and-white television sets (an absolute necessity, or so everyone said at the time), and it brought color television into nearly every home.

Unfortunately, the result was a compromise, and has left us with a legacy of problems. To understand all of this we must first understand how the National Television Standards Committee (also affectionately known as "Never Twice the Same Color") standard works.

All television, black and white or color, uses the same basic technology, the cathode ray tube (CRT). All CRTs share similar design elements:

1. One or more electron guns that shoot electrons at the phosphor coated inside of the CRT.

2. Deflection circuits that scan the electron beam across the surface of the CRT from left to right and from top to bottom, creating scan lines that make up the final image.

3. Blanking circuits that turn the electron beam off during the time it returns from each left to right scan, and during the time it returns from the bottom of the CRT to the top.



In Black And White

Now let's look at how black-and-white television works. Imagine a piece of chalk placed on top of a piece of black velvet. A video camera pointed at this scene would create a signal with no luminance (brightness) for the black velvet, and maximum luminance for the chalk. In other words, while the electron beam is scanning across the CRT creating the portion of the image that display the black velvets it will produce no electrons, but while it is recreating the chalk it will produce its maximum amount of electrons. Scenes with intermediate values would produce intermediate amounts of electrons.

The electron gun is controlled by the deflection circuits. These respond to two synchronization signals: the horizontal sync signal that moves the electron beam from side to side 15,750 times a second, and the vertical sync signal that moves the electron beam from top to bottom 60 times a second.

Each sync signal has a blanking interval, during which time the electron beam is turned off. The blanking interval occurs during the time the beam retraces across the CRT to avoid drawing random lines across the image.

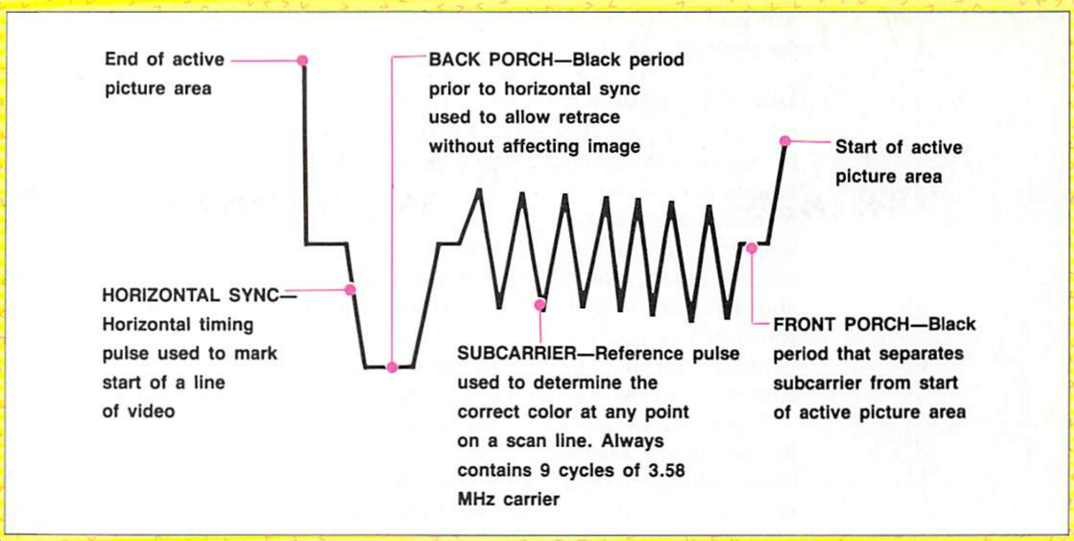
These are the basics of black-and-white television. The video signal contains luminance information (the image portion of the signal) and sync information (the control and timing portion of the signal). The tricky part of NTSC was retaining this while adding color.

Now for a short digression. Any electronic signal (analog not digital) can be changed in three ways. You can make it vibrate faster or slower, changing its frequency; you can make the signal stronger or weaker, changing its amplitude; or you can make its oscillation occur sooner or later, changing its phase. Color television circuits make use of all three.

The luminance portion of a video signal is set by the amplitude of the signal, leaving us the use of frequency and phase for carrying color information. Color video starts life as discrete red, green, blue, luminance and sync signals.

Using logic similar to New Math, these signals are combined in the following fashion. The blue and luminance signals are combined to create the Inphase subcarrier (I signal), the red and luminance signals are combined to create the Quadrature subcarrier (Q signal). Luminance is now called the Y signal. Simple algebra will let us reconstruct the original R, G and B signals at any time. All you need to know is that R + G + B = Y. Got it so far?

Take a deep breath and try to stay with me. To create a color video signal we start with a reference signal.



This is called the color subcarrier, and it has a frequency of 3.58 MHz. It is also known as color sync or burst. The horizontal and vertical sync pulses are a part of the color subcarrier. Now we add in the I signal, also at a frequency of 3.58 MHz but out of phase by 57 degrees so that we can tell it apart from the color subcarrier. Finally we add in the Q signal, again at 3.58 MHz but out of phase by 147 degrees from the color subcarrier. The Y signal is carried as amplitude variations of the color subcarrier and the color information is recreated by the phase relationships of the Y, I and Q signals. Simple, don't you think?

Compatibility with black-and-white television is maintained by ignoring the phase relationships (and in fact by ignoring the I and Q signals) and just displaying the Y signal controlled by the sync pulses in the color subcarrier.

This is a simplified (yes that's right, simplified) explanation of how NTSC video works. If you were to look at an NTSC signal on a waveform monitor you could see the various components (see illustration). The waveform monitor display does not directly deal with the phase relationships of the Y, I and Q signals; these would be shown on a vectorscope.

Genlock

When two or more video sources are connected together, for instance while editing a production shot with two or more cameras, it is necessary that the sync and color phase relationships have the same timing. Switching between two video signals with differing sync signals can cause the image to roll or shift to one side or another. Switching between two video signals with different color timing can cause color shifts.

Genlock equipment allows video sources to be synced by using an external burst signal. This gives all video sources the same reference for sync and color phase. Genlocks for the Amiga accept an external video source, and use its burst signal to set the timing and phase of the Amiga's video output.

Time Base Correctors

NTSC video requires precise timing of sync and phase information to produce a correct color image on a CRT. Imagine the effects of the equivalent of wow and flutter on a VCR's output. The slightest variation in tape speed across the playback head can result in changes to the timing of the horizontal and vertical sync pulses and the phase relationships of the Y, I and Q signals.

A Time Base Corrector (TBC) can accept as input a video signal with timing and phase errors and output a video signal that is stable and accurate. This is accomplished by storing part of the video signal (one or more lines) and adding a correction to offset the errors. The number of lines stored in the TBC is called the window size. Some TBCs have a full window, and can store a full video frame, and display it as a freeze frame. TBCs with this capability are also known as Frame Synchronizers. Most TBCs today store video digitally, and some can provide special effects. Also, most TBCs will accept an external sync signal, and can be used as a form of genlock. □

—Matthew Leeds

VIDEOSCAPE 3D from Aegis Development uses a type of animation known as solid modeling. It depends on objects created by a method similar to that of a draftsman, whereby each line is plotted on graph paper and then entered into a script file for use by the program in creating the object. Three programs are included which help in the creating and editing of objects. (As of this writing, Aegis is Beta testing a program that will make this task even easier.) Light source, camera motion and object movement are controlled via script files. Real-time playback of animation is accomplished by a compressed animation method known as the ANIM format. This package is not copy protected, supports a genlock and limited overscan in all resolution modes. (Aegis is working on an update that will support true overscan.)

ANIMATOR: APPRENTICE by Hash Enterprises creates character-type 3-D animation. The package functions in a modular environment with the first module using images from a paint program or digitizer to create objects. A front and a side view of any object can be used to create a three-dimensional version of the original object. Once completed, the module has the ability to take a digitized picture (e.g., a picture of someone's face) and matte it onto the object to further enhance realism. The rest of the modules permit almost unlimited manipulation of the object(s).

This program operates in the HAM mode to allow for maximum shading and realistic color. It also boasts adjustable light source and perspective (camera) controls and comes equipped with a predefined library of sample actions and characters. Animator: Apprentice supports overscan (352 × 240 HAM and 704 × 480), the use of a genlock and is not copy protected.

FORMS IN FLIGHT. Micro Magic's Forms in Flight allows you to create both 2-D and 3-D objects. Pull-down menus make it easy to control such features as pans, viewpoint, light sources, magnifications, shading, editing, etc. The image-creation section operates in either 640 × 400 or 640 × 200, both with 16 colors. The playback sequence operates in all resolution modes with up to 32 colors in low and interlace resolutions. The Fast Flight player program permits playback in real time with overscan (704 × 444). The program is not copy protected and includes demo objects.

DELUXE PRODUCTIONS from Electronic Arts is a high-resolution graphics animation tool suited for 3-D business applications. Featured is double buffering for smooth animation, over 40 fast-screen transitions, including venetian blinds, scatter, spirals and diagonals, all of which give a professional appearance.

This program operates in overscan (672 × 444) and is IFF compatible. It's equipped with high-resolution backgrounds for sports, news and weather broadcasting, business presentation graphics, fonts, etc. Deluxe Productions is copy protected and is genlock compatible.

Paint Programs

IN MOVIES AND television, there are often times when it would be impossible or impractical to build a large set. Such is the case with many fantasy and

science fiction films. The director has the artist create what is called a Matte painting; for example, a small section of the whole set is constructed, such as a window, with the remainder left to be drawn or painted around the current set. The matte painting could be, for example, background buildings of a futuristic city or a lazy moon suspended in the sky of an alien planet. Using a paint program with a genlock, this same procedure can be accomplished at home.

DELUXEPAINT II, the popular paint program from Electronic Arts, contains features of comparable paint boxes in the $10,000+ price category. Operating in all of the Amiga's screen modes except HAM, DeluxePaint II gives you the flexibility to create images as complex as your imagination will allow. DeluxePaint II supports the use of a genlock and is copy protected.

DIGI-PAINT. The Amiga Hold-and-Modify mode was not fully utilized by any piece of software until NewTek, Inc. released Digi-Paint. This program offers access to all of the Amiga's 4,096 colors, plus a few extra with the dithering mode. One of its unique features is colorization (the tinting of black-and-white pictures with any shade of color or colors).

NewTek plans to incorporate overscan into future revisions. Digi-Paint is not copy protected, yet it requires a password to access the program. Digi-Paint also will support a genlock.

PRISM! *AND* PRISM PLUS from Impulse Inc. are two more HAM editors for the Amiga. Prism! is designed to work with 512K machines while Prism Plus requires a megabyte of RAM. Both programs are included in the Prism Plus package. In addition to letting you create and edit 4,096-color pictures, Prism Plus lets you create images up to 1024 × 1024 pixels.

Special Purpose/ Utility Programs

THESE TYPES OF programs have a specialized function in that they assist other programs in performing a specific task.

INTERCHANGE from Syndesis enables object files to be shared between VideoScape 3-D and Sculpt 3-D. The program permits object files created with the object editor in Sculpt 3-D to be transformed so that VideoScape 3D can animate them. Objects created by VideoScape 3D can, in turn, be used by Sculpt 3-D in ray-traced scenes.

THE DIRECTOR from The Right Answers Group is a composite sequencing program with the ability to page flip full or partial IFF screens in any resolution with overscan. It can play VideoScape 3D animations, digitized sound tracks, and offers simultaneous fades, color cycling, dissolves and wipes.

ANIMATION EFFECTS. Hash Enterprises' Animation Effects is designed to simulate a Digital Video Effects (DVE) unit with support of overscan. Enabling the operator to "cut out" a portion of any IFF or HAM image, movement such as flipping, rotating, flying and more can be achieved, functioning similar to an ADO.

PAGEFLIPPER from Mindware International permits any combination of IFF images in any resolution to be "flipped" through at 30 frames per second, creating cell animation. The program utilizes all memory available, up to 8.5 megabytes, and supports overscan (764 × 480).

BUTCHER. Eagle Tree Software's Butcher can modify images created by a digitizer or paint program. It will convert any image from any resolution to any other resolution, including HAM. Other features include Positive/Negative reversal, Mosaic, color separations and true overscan.

PIXMATE. Progressive Peripherals & Software's PIXmate is an image-enhancement program used to enhance details in any image as well as perform various special effects. The program supports overscan and the HALFBRITE 64-color mode and will also convert images from one resolution to another.

HARDWARE

Genlocks

THE AMIGA IS the first home computer with the ability to genlock, that is, "synchronize" its video output with an external device (e.g., video camera, VCR, etc.). To understand how video functions, think about the way motion picture film works in a movie camera. Each frame is a certain size, both horizontally and vertically. The same holds true for video. There must be a starting and stopping point for each frame, and this information is termed sync. All video components must have identical sync to permit them to function together. This is where the genlock comes into the picture. With a genlock, graphics from the computer can be overlayed onto video, then recorded for a finished product.

COMMODORE A-1300. The first genlock, the Commodore A-1300, was designed for consumer applications only. While not recommended for broadcast use, it will sync the computer to an external video source and comes with a three-position switch. The switch determines how the video is modified; in the first position, the computer's video is sent straight through unmodified. In the second position, the incoming video ►

GLOSSARY

ADO (AMPEX DIGITAL OPTICALS)—a device used in broadcast television to accomplish various image transitions and special effects with video.

ANIMATION—a method of simulating motion.

ANIM FORMAT—a format "standard", still in the development stage, whereby animations can be compressed to allow real-time playback.

CHARACTER GENERATOR—a hardware device that places text in the form of titling on video.

COLORIZATION—the tinting of black-and-white pictures with any shade of color or colors.

COMPOSITE VIDEO—a combination of chroma, luminance and sync.

COPY PROTECTION—any of several methods whereby a disk or program is protected so that a back-up copy cannot be generated.

DIGITIZER—a hardware device that takes video from either a video camera or a VCR and converts it to digital information.

DITHERING MODE—a method of rapidly displaying one or more colors on the same pixel, thus creating the illusion of another color.

DOUBLE BUFFERING—a method of creating smooth animation by using two or more separate memory locations, the first displaying the image and the second loading the next image.

ENCODER—a "combiner" that takes the individual components (red, green and blue) and adds both horizontal and vertical sync together to create composite video.

FRAME BUFFER—a device used to capture, display and store a video frame.

GENLOCK—a hardware device that extracts synchronization signals from incoming video to be used to "lock" the computer's sync generator to the incoming video.

HALFBRITE—a chip included in recent Amiga computers that extends the color capability in low-resolution mode from 32 to 64.

HAM MODE—Hold-and-Modify mode, in which 4,096 colors can be displayed simultaneously.

KEY SIGNAL—a black-and-white signal used by broadcast switchers to permit keying of graphic information.

KEYER—a device, usually found as part of a genlock, that will overlay the computer's graphics on top of video.

MATTE—a French-derived term meaning to combine two images together to create a single image.

OVERSCAN—a feature (of hardware and software) that allows a program to fill an entire video display screen.

PAINT BOX—a hardware device that uses a mouse or drawing tablet to create drawings for video.

PAL SYSTEM—the television system used in Europe.

RAY TRACING—a method whereby one or more light sources are assigned to a specific point while the computer traces each "beam" of light to its conclusion.

RESOLUTION—on a video display, the number of pixels that can be displayed in the horizontal and vertical directions.

RS-170A—a standard in the video industry set up as a guideline for proper synchronization of video signals and components.

SUBCARRIER PHASE—an adjustment by which the chroma can be adjusted between zero and 360 degrees, similar to the hue adjustment found on most television sets.

is unmodified at its output. Finally, in the third position, graphics are keyed on top of incoming video.

SUPER GEN. Designed by an ex-Grass Valley Group engineer specifically for the Amiga, the Super Gen from Digital Creations has both video-in and loop-through connectors along with two video outputs, a key signal for use with downstream keyers, and two fader bars. The first fader bar will fade incoming video to black while the second will dissolve the Amiga's graphics over the video. Both of these faders can function under either software or manual control. PVS Publishing's Pro Video Plus contains the drivers necessary to control both faders. The unit also includes a notch filter to eliminate chroma cross talk. The video outputs are broadcast-quality NTSC and adhere to the RS170A broadcast standard. All connectors are professional BNCs for easy installation to any broadcast equipment.

AMIGEN. Mimetics Corporation's AmiGen is a low-cost genlock that inputs standard composite video and outputs the computer's graphics keyed over the incoming video. This unit boasts output of a broadcast-quality signal.

GENKEY. SciTech's GenKey includes a genlock, a time-base corrector (TBC), and a keyer, all in one unit. It includes a vertical interval switcher that permits glitch-free switching among external video, computer video or the key video. A video processing amplifier is built into the package allowing for gain adjustment of each color component plus adjustment of setup level. GenKey has a loop through for external video with 75 ohm termination switch, an RGB out and broadcast-quality composite video out. All connectors are professional BNC for convenient installation to broadcasting equipment.

RM-2. GlennLoc's synch generator and genlock has the ability to genlock to an external video source and resynchronize the output to RS-170A standard. RM-2 is housed in a 19″ rack-mount case with external adjustments for subcarrier phase, horizontal phase and an internal color bar generator. Featured also is the ability to control the video level of graphics mixed over the external source.

DIGITIZERS

DIGITIZERS ARE used to transfer a fixed image (e.g., a lamp, a photograph or any other tangible object) into a 2-D representation of the original. Digitizers transform the analog video information to digital, whereby the computer can understand the information and use it to plot each pixel on the screen and assign it the correct luminance and hue.

DIGI-VIEW was the first digitizing hardware for the Amiga, designed and marketed by NewTek. Digi-View uses the familiar three-color process (similar to Tech-

nicolor) in which a black-and-white camera scans a photograph, and after taking three separate exposures (red, green and blue), the image is then combined into a 4,096-color (or more) rendering of the photograph. With this process of separating individual color components, a high-quality image can be captured. Digi-View cannot at present digitize an overscanned picture; however, NewTek has completed a new version of the software that will support overscan. Also under development at Newtek is a device that will allow a color signal from either a camera or VCR to be digitized without the necessity of using the color wheel. Retail price is expected to be approximately $100.

LIVE!. A-Squared Distributions, Inc. has released Live!, a video digitizer with the capability of digitizing a single frame from any video source. The source can be either color or black and white and derived from either a video camera or videotape. Live! can also digitize and display moving images at 15 frames per second (normal frame rate for video is 30 FPS). These images can be saved in IFF format or stored in RAM as compressed consecutive images (up to 8 MB) for playback in real time. Live! operates in HAM or 32-color mode and has both video-in and loop-through connectors for easy connections.

PERFECT VISION, developed by SunRize Industries, Inc., is a combination digitizer/frame buffer with the capability of digitizing a color signal (into its one megabyte of on-board RAM) from any source (camera or videotape) and displaying the signal or saving it as an IFF file for use with other programs. Perfect Vision ►

Product Information

AMIGEN
Mimetics Corporation
PO Box 60238 Sta. A
Palo Alto, CA 94306
408/741-0117
$179

ANIMATE 3-D
Byte By Byte
Arboretum Plaza II
9442 Capitol of Texas Hwy. N.
Suite 150
Austin, TX 78759
513/343-4357
$150

ANIMATION EFFECTS
Hash Enterprises
14201 SE 16th Circle
Vancouver, WA 98684
206/256-8567
price not available

ANIMATOR: APPRENTICE
Hash Enterprises
(See address above)
$295

BUTCHER
Eagle Tree Software
PO Box 164
Hopewell, VA 23860
804/452-0623
$37

COMMODORE A-1300 GENLOCK
Commodore Business Machines
1200 Wilson Dr.
West Chester, PA 19380
215/431-9100
$299.95

DELUXE PRODUCTIONS
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
415/571-7171
$199

DELUXEPAINT II
Electronic Arts
(See address above)
$129.95

DIGI-PAINT
NewTek, Inc.
115 West Crane St.
Topeka, KS 66603
913/354-1146
$59.95

DIGI-VIEW
NewTek, Inc.
(See address above)
$199.95

DIRECTOR, THE
The Right Answers Group
Box 3699
Torrance, CA 90510
213/325-1311
$69.95

FORMS IN FLIGHT
Micro Magic
Suite 320B
261 Hamilton Ave.
Palo Alto, CA 94301
415/327-9107
$79

FRAME CAPTURE
Mimetics Corporation
(See address above)
$199.95

GENKEY
SciTech Corporation
1450 Northwest 78th Ave.
Miami, FL 33126
305/591-1620
$760

INTERCHANGE
Syndesis
20 West St.
Wilmington, MA 14213
617/657-5585
$49.95

LIVE!
A-Squared Distributions
6114 La Salle Ave, Suite 326
Oakland, CA 94611
415/339-0339
$295

PAGEFLIPPER
Mindware International
110 Dunlop St. W.
Box 22158, Barrie,
Ontario, Canada L4M 5R3
705/737-5998
$29.95

PERFECT VISION
SunRize Industries, Inc.
3801 Old College Road
Bryan, TX 77801
409/846-1311
$219.95

PIXMATE
Progressive Peripherals
& Software
464 Kalamath St.
Denver, CO 80204
303/825-4144
$49.95

PRISM PLUS (WITH PRISM!)
Impulse Inc.
6860 Shingle Creek Pkwy. #110
Minneapolis, MN 55430
612/556-0221
800/328-0184
$69.95

PRO VIDEO CG1
PVS Publishing
3800 Botticelli, Suite 40
Lake Oswego, OR 97035
503/636-8677
$199.95

PRO VIDEO PLUS
PVS Publishing
(See address above)
$299.95

REASYN
Mimetics Corporation
(See address above)
$699.95

RM-2
GlennLoc
3903 Carolyn Ave
Fairfax, VA 22031
703/273-5663
$2,500

SCULPT 3-D
Byte By Byte
(See address above)
$99.95

SILVER
Impulse Inc.
(See address above)
$169

STATION MANAGER SERIES
Associated Computer Services
1306 East Sunshine
Springfild, MO 65804
417/887-7373
$295 each

SUPER GEN
Digital Creations
1333 Howe Ave. Suite 208
Sacramento, CA 95825
916/344-4825
$749.95

TV SHOW
Brown-Wagh Publishing
16795 Lark Ave
Suite 210
Los Gatos, CA 95030
408/395-3838
$99.95

TV TEXT
Brown-Wagh Publishing
(See address above)
$99.95

VIDEOSCAPE 3D
Aegis Development
2210 Wilshire Blvd.
Suite 277
Santa Monica, CA 90403
213/392-9972
$199.95

VIDEO TOASTER
NewTek, Inc.
115 West Crane St.
Topeka, KS 66603
913/354-1146
$199.95, $799.95

VIDEOTITLER
Aegis Development
(See address above)
$49.95

works with all Amigas and will digitize an image in one-sixtieth of a second. It operates in 320 × 200 or 320 × 400 HAM and in the 16-color mode.

FRAME CAPTURE from Mimetics Corporation, although a digitizer itself, only functions when connected to ReaSyn, Mimetics' frame buffer. It accepts a standard color video signal from any source and digitizes the signal for storage in the IFF format.

Frame Buffers

DUE TO THE advances of digital electronics in video applications, a frame buffer can be used to capture and store a video frame with up to two million colors. Because of hardware limitations, the Amiga can display only 4,096 colors. However, there is sufficient information present for over two million colors to be displayed. The only thing lacking is the hardware to display them.

REASYN, Mimetics' frame buffer, has the ability to display an image 740 × 480 with two million colors. Equipped with one megabyte of on-board RAM, it plugs into one of the expansion slots on the Amiga 2000. An external expansion box, which will run 2000 cards, is the only means by which the frame buffer can be used with the Amiga 500 or 1000. As mentioned above, the frame capture board attaches to this board, adding the ability to capture a video frame from any source and save it to disk. Currently, Byte by Byte and Aegis are working to make it possible to display graphics from Sculpt 3-D, Animate 3-D and VideoScape 3D on the ReaSyn frame buffer.

VIDEO TOASTER is the most exciting advancement to come along in recent months. Developed by NewTek, this device will emulate a two-channel ADO. The unit will accept two video sources (either synced or not synced) and allow various effects (e.g., a rotating cube with one picture on one side and another picture on another separate side) to be generated in real time without placing a burden on the Amiga's normal operations. Also built into the unit is a digitizer, a frame buffer and a genlock.

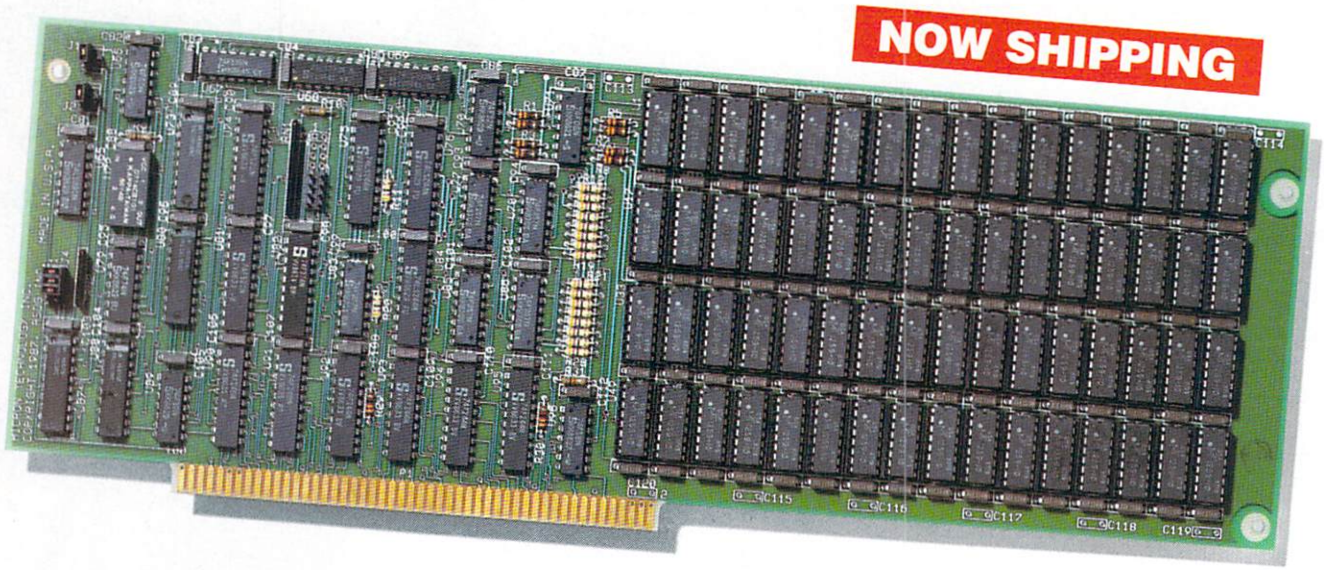
Encoders

AN ENCODER MAY be described as a "combiner" that takes the individual components (red, green and blue) and adds both horizontal and vertical synch together to create composite video. These units come in a wide range of size and configuration, from as small as an NTSC color encoder on a chip to as large as a rack-mountable unit. Most broadcast houses use these units to obtain composite video from their character generators and paint systems, but their $2,500+ price tag put them out of reach for most consumers. Another possible application of encoders would be one designed for Europe's PAL system, whereby the encoder could utilize the standard red-green-blue components along with available video application software to create startling effects without having to change the software.

Ever since the initial release of the A1000, the Amiga was designed to provide an inexpensive means to integrate graphics and sound. The software and peripherals needed to make this a reality are finally in existence, at prices available to the average user. Third-party developers have a number of exciting projects in the works, and you can expect prices to drop as the field of desktop video matures. ■

Wayland W. Strickland is a producer/director of live television for a satellite television station based in Orlando Florida. Write to him c/o AmigaWorld, *Editorial Department, 80 Elm St., Peterborough, NH 03458.*

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PROBING ALIEN WORLDS

EXTRATERRESTRIAL VIDEO



EDITOR'S NOTE: On June 6, 1987, a Los Angeles PBS television station, KCET-28, aired an astonishing 30-minute show simulating the contact of an unmanned probeship with an alien "planet" in the Alpha Centauri system. Entitled "California Stories: Contact," the program was produced using a battery of Amigas and supporting graphics/video software. Centering on the work of CONTACT—a group of prominent scientists, aritists and science fiction writers that meets annually to discuss human futures in space and possibilities of extraterrestrial life—the PBS show filmed the group's March 1987 conference, which culminated in the Amiga-generated probe sequence. The finale—the reconstruction of an alien being from an unearthed skull—was both a haunting experience and a striking display of the power of the Amiga.

As Harv Laser, moderator of the Amiga Forum on PeopleLink, remarked in a message posted after the show, "The program . . . makes the heaviest use of Amigas I have yet seen in any aired program . . . it is well worth 30 minutes of your time, not only for the subject matter, but to see Amigas actually being used on a television show to do something, instead of just sitting there looking like high-tech props."

A co-host of CONTACT—Joel Hagen, a graphics artist responsible for much of the Amiga work in the program—shared with us details of this fascinating project . . .

by JOEL HAGEN

Right: Probe Series A

APPROACH TO PLANET ACHILLES

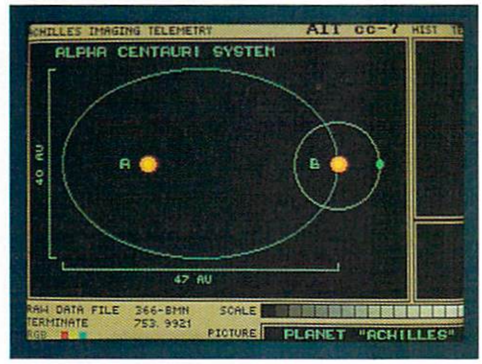
The 1987 edition of the CONTACT conference in Aptos, California, proved to be as fascinating an exercise in visualizing the possibilities of life in outer space as anyone is likely to experience. And it was a team of Amigas and computer artists who would turn this annual gathering of artists and scientists into a remarkable documentary exploration of the prospect of extraterrestrial life.

I had been using the Amiga primarily for graphics. I did a series of astronomical renderings during the 1986 Voyager encounter with Uranus (see *AmigaWorld*, Sept./Oct. 1986, p. 26), and recently I had illustrated science fiction books using DeluxePaint II and Digi-View. I had planned to bring my Amiga to CONTACT to use in place of a sketchpad during the fast-paced brainstorming sessions. It soon occurred to me that I had a unique opportunity to field test this personal computer as a "universal tool" to handle all our needs.

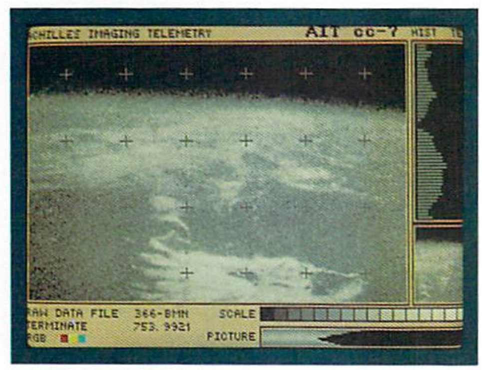
With the Amiga, we could replace sketchpads and chalkboards with graphics and CAD software, typewriters with word processors, orientation sheets with computer slideshows and so on. We could even do the mailing lists, letter writing and other business on the same system. Support from all fronts was enthusiastic. I soon had assurance of a powerful range of tools for the experiment.

In addition to academic symposia and workshops, the focus of the conference was to be a creative experiment in which participants would be divided into two teams. One group would create a future space-faring human culture. The other group would create an alien planet and populate it with a culture-bearing life form. The finale of the conference would be a meeting of the two teams, acting out a contact scenario.

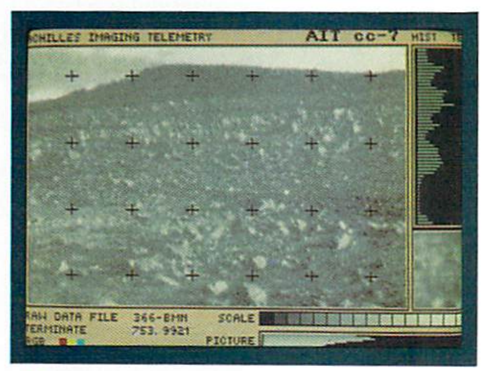
One of my pre-conference tasks was to create clear visual designs of the human spacecraft. I used the Aegis Draw Plus CAD package to design a huge spherical ship conforming to guidelines suggested by members of the human team. Draw Plus is an interesting package. The display you see on the high-resolution screen is only a representation of the drawing—the coordinates are independent of the screen. If you want to zoom in, the lines remain the same thickness, the curves remain true and detail suddenly jumps out at you. I had fun creating sections of hardware, shrinking them to fit on a dish antenna I made, then shrinking the whole assembly down to store it. I later added it as a small detail on the drive section of the ship. It looked as good on the 640 x 400 screen, and when I zoomed in on that section, suddenly there was a screen full of sharp, new detail. ►



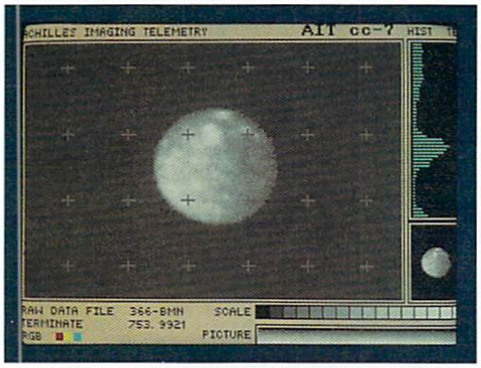
A1: Position and orbit of Planet Achilles (far right) in Alpha Centauri System



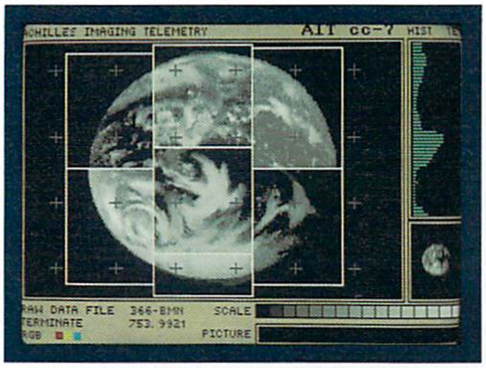
A5: Land masses on the planet—with lovely ragged coastlines—are seen against ocean background.



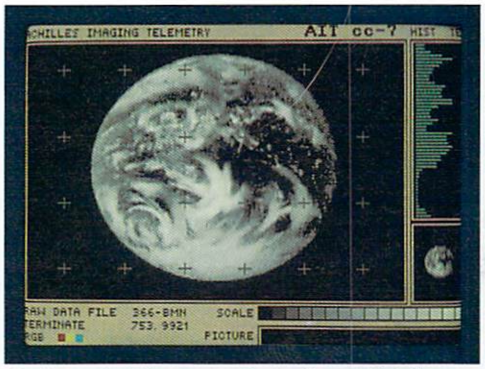
A9: Close-up view of site area as skull (bottom right quarter) is composited into landscape.



A2: Close-up of first isolated view of Achilles from Earth probeship.



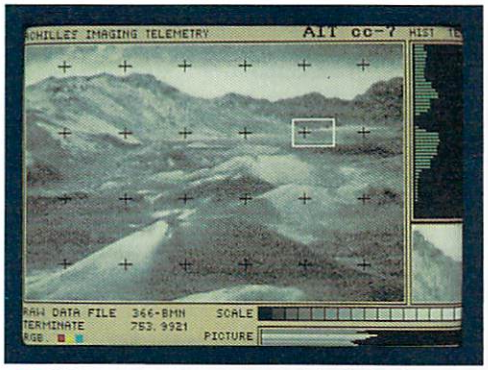
A3: Framework overlay delineates a variety of topographical sectors of the planet's surface.



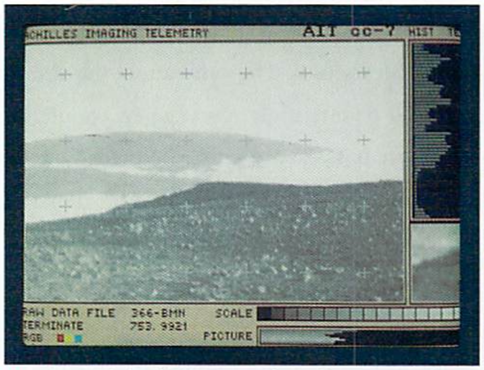
A4: As probeship approach continues, details of surface start to become more definite.



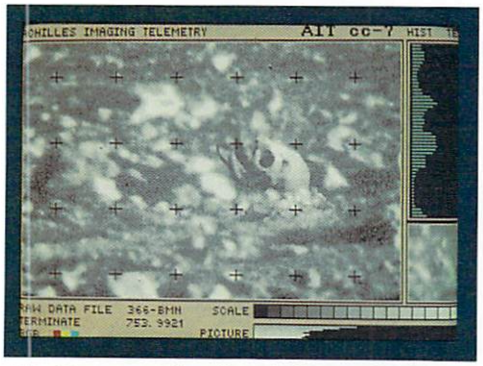
A6: Textures of landscape become well defined as probeship moves quite close to the surface.



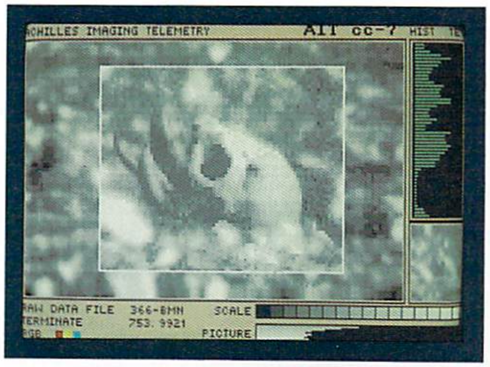
A7: White rectangle at upper right in further close-up shows site area where skull will be found.



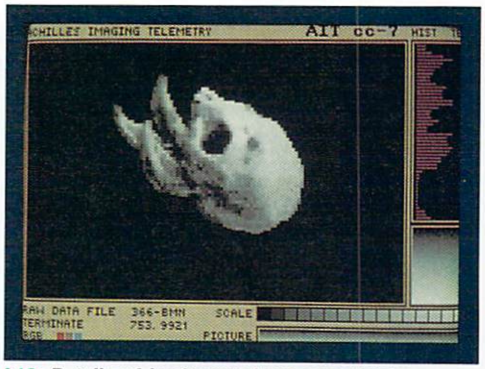
A8: Area of detail from previous frame reveals site area as rocky, barren landscape.



A10: Close-up of the alien skull, now clearly recognizable in the rocky landscape.



A11: Animation sequence continues as skull apparently begins to be removed from surrounding image.



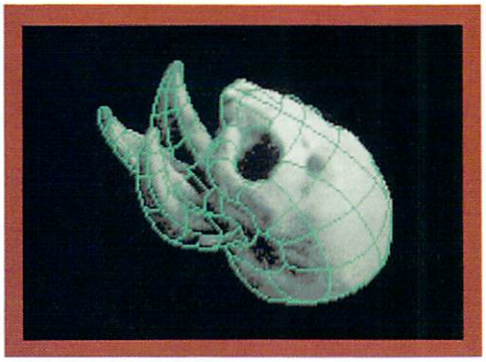
A12: Details of background are completely cleaned up, leaving only the alien skull.

My next task combined sculpture, photography and computer art in preparation for representing the alien planet. Using work from the alien team, I sculpted the creature and made a full-size model of its skull (see Probe Series B photo sequence). I digitized these with Digi-View, storing many images from all angles on disk. I also digitized photos I had shot in Hawaii of barren basalt terrain at 14,000-foot elevation. These would serve as suitably desolate alien landscapes (see Probe Series A photo sequence, A6–A9).

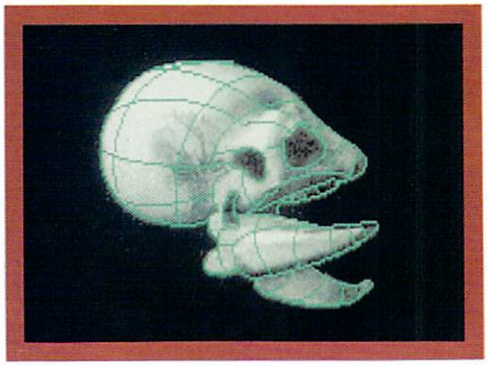
Using DeluxePaint II, I cleaned these pictures up, removing extraneous backgrounds from the models and making palettes consistent. The combination of Digi-View and DeluxePaint II is a favorite of mine. For digitizing, I picked up an old black-and-white RCA home video camera and found it very sensitive to light. I get clear pictures without using intense lights to illuminate my subject. I usually set the Digi-View sharpness up about +5 for a little extra detail, and I hold it there through an entire sequence of images for a consistent look. The only annoying thing about this otherwise fantastic digitizer is the shuffled palette it gives you when you digitize in black and white. This palette does make the menu bars easy to read when you load such an image into DeluxePaint II, but it cripples features like "shade" and "blend" that require a sequential scale of values to operate properly. You get around the problem by bringing up the palette in Deluxe Paint II. Use "spread" to sequence the values from black to white, then "remap" the picture to the new palette before saving it.

Right: Probe Series B

RECONSTRUCTING THE ALIEN BEING



B1: Partial wireframe representation of skull begins, superimposed on solid skull.



B5: Removal of wireframe structure begins, as skull has rotated to full right view.

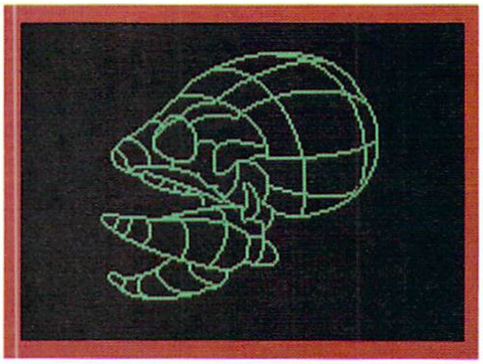


B9: Alien head is now fleshed out using sculpting techniques to texture skin.

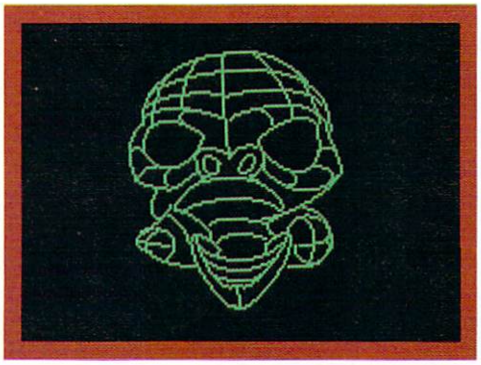
Gearing Up For The Journey

Armed with this preliminary scrap file of extraterrestrial images on disk, I arrived at the conference. The computer room was open 24 hours a day, and by the end of the first evening, that room was packed with hardware, cables, video gear and glowing screens. By the end of the weekend, it looked like a flight control center.

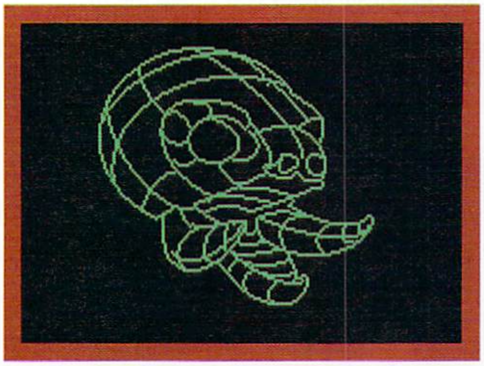
I was soon joined by CONTACT's other computer artists. Keith Doyle was working on sound synthesis and alien speech in addition to graphics and animation. Darrel Anderson was doing beautiful 3-D animations of space probes. In short order, we had five Amigas up and running with a couple of expansion RAM boards, a hard disk drive, a couple of printers and a spare high-persistence monitor. ►



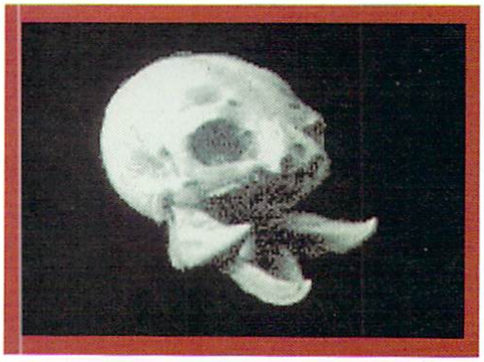
B2: With curved-line feature of DPaint, wireframe representation of left view of skull is completed.



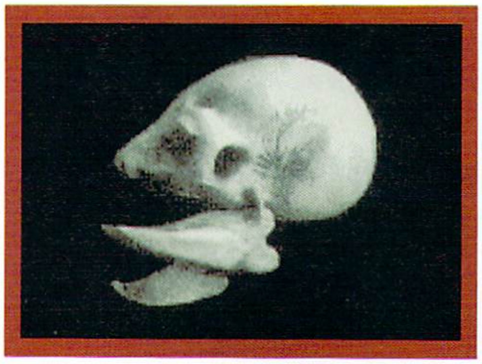
B3: Wireframe representation begins rotation to full head-on view.



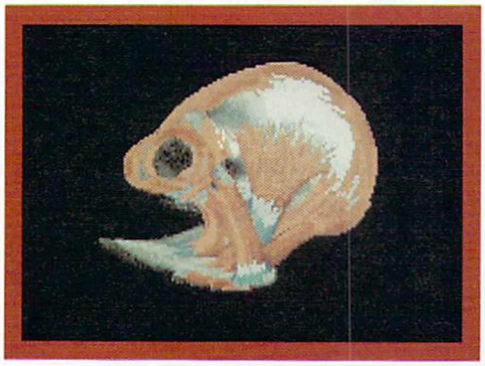
B4: Animation sequence continues with wireframe rotation moving toward right view.



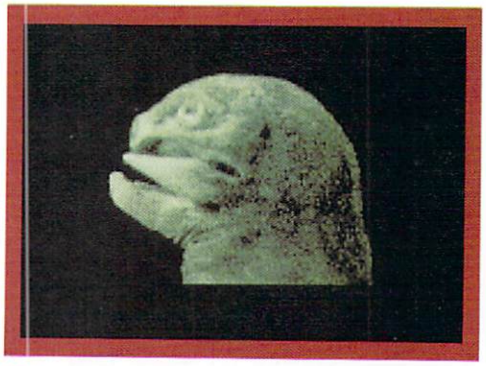
B6: Animation sequence now reverses toward left with skull intact.



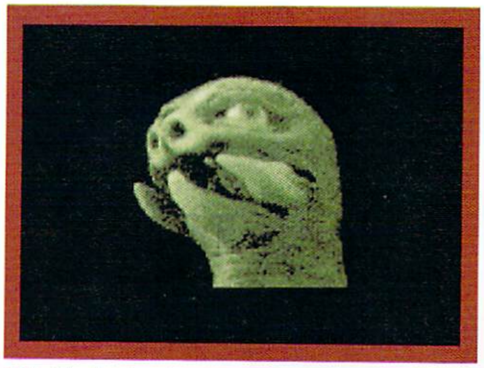
B7: Full rotation of solid skull now complete, returning to original left view.



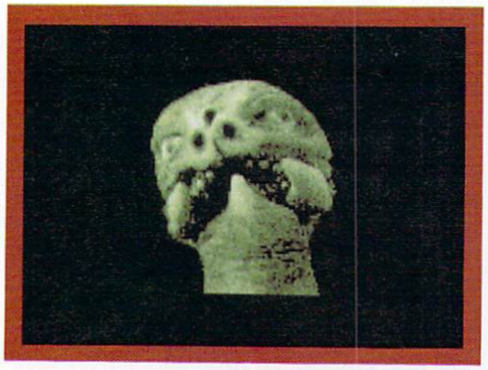
B8: Musculature for alien head is painted using DPaint's "fix background" mode.



B10: Color is now added to the completed, fully-textured alien head.



B11: Final animation sequence of the alien head begins with rotation right.



B12: Head-on view of the fully-reconstructed alien creature from Planet Achilles.

By the second day of CONTACT, we were rolling at full speed. The alien team was supplying us with data that we translated into charts and animations to simulate telemetry for the human team. I used DeluxePaint II to create false color orbital views of the planet the human team was "approaching."

Using yellows and greens, I isolated a palette range from bright yellow at one end to dark green at the other. I filled the entire screen with dark green, then made a one-inch circular brush. Using the "shade" feature, I rapidly moved around the screen, alternately using the left and right mouse buttons to shade up and down the selected palette. Making the brush smaller, I continued the process. In less than a minute, interesting "aerial" views of random landscapes began to emerge from the smoothly graded color areas. Finishing details of fjords, islands and channels were done with a yet smaller brush (see Probe Series A3–A4). The final step was to fill the large dark green areas with blue. This "popped" the "land" masses out against the "ocean" background, leaving beautiful ragged coastlines, very fractal in appearance (see Probe Series A5). I am continually impressed with DeluxePaint II. Nearly every project I do passes through that paint system at some point. I can't imagine the Amiga without it.

The conference attendees were loving the Amigas. Throughout much of the day, the audience was involved with the main conference program, but at night the computer room was standing room only. A popular program running on one of the machines was a version of "Animal" Kieth Doyle had rewritten for the Amiga. We changed the prompts in such a way that users seemed to be consulting a vocational guidance computer that suggested various functions they might perform aboard a colony starship. By the end of the weekend, there was an extensive and interesting database.

We found two pieces of software that were used to greater effect after, rather than during the conference. The data accumulated by our vocational guidance program was well suited for entry into the Expert System Kit—a program that lets you establish a set of rules, then functions as an expert, to be consulted for logical answers on the subject. The second program, Infominder, is designed to store and access information. It creates a hierarchical structure of documents and graphics available through menus and outlines. Entering the information can be quite a project, but the results are clean, powerful and easy to use by anyone who can push a mouse.

Another program popular at CONTACT was Aegis Animator. This is probably the most instantly gratifying animation software on the market. Anyone can sit down and use the morph feature to create colorful moving and changing shapes in minutes. We used one of the digitized alien models with Animator to put the jaws and mouth parts in motion. Cutting the jaws out as windows, we laid out movement paths for them to follow in an endless loop. It worked pretty well.

All Systems Go: Filming The Probe Sequence

The television crew was beginning to look anxious when they came to check our progress. They were waiting for the end of the conference to shoot the computer room sequences,

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and I could see they were wondering what we could put together in the time remaining. I wanted to simulate a realistic space-probe telemetry sequence on the Amiga. The Voyager encounter I had witnessed at Pasadena's Jet Propulsion Laboratory had made a vivid impression on me. I wanted to capture something of that flavor. I intended to show the approach to the planet, penetration of the atmosphere, survey of the surface, discovery of an alien skull and simulated computer modeling of the living creature based on analysis of the skull. I wanted it to look real.

Joel Hagen is, among many things, a graphic artist whose credits and projects span a fascinating range—from art to astronomy and software development to science fiction. Write to him at 10512 Sawyer, Oakdale, CA 95361. CONTACT was founded by anthropologist Jim Funaro. For more information about the organization, write CONTACT, Department of Anthropology, Cabrillo College, Aptos, CA 95003.

I needed to be able to use the full palette, not be limited to eight colors. I needed to generate text, I needed page-flipping control over partial screens without disturbing the rest of the display, and I needed custom control over the way pictures were displayed in order to simulate a telemetry scan. I knew from experience that none of the software available could handle this. Keith Doyle, however, had been developing a display and animation language called The Director (which he has since developed into a remarkable commercial package). When I talked with him prior to the conference, he seemed confident that The Director could produce all the effects I was after. He brought a beta version with him to CONTACT and showed me how to use it.

I quickly became a believer. Simple commands similar to BASIC language statements controlled everything. It was possible to build up a very complex display in easy stages. The probe sequence gradually took form. I used DeluxePaint II to composite the skull into the rocky landscape (see Probe Series A8–A10). Keith took this and animated an impressive sequence in which the computer seemed to remove the skull from the surrounding image (see Probe Series A11–A12). While he worked on this, I used the curved-line feature of DeluxePaint II to draw wireframe representations of the skull (see Probe Series B1–B5). I painted musculature for the alien head (Probe Series B8) using the "fix background" mode to keep a skull intact as an underpainting while I worked on top of it like an overlay. These images were packed into four screens for a page-flipping animation in which the wireframes rotate, are analyzed and rotate back as solid skulls.

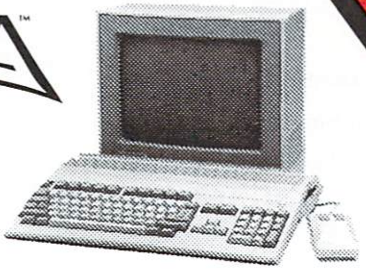
The imaginary modeling of the alien started from the buried skull and worked through wireframes and musculature to the fleshed-out creature (see Probe Series B9–B12). The sequence ran flawlessly to cheers from the group packed around the monitors. At that point I knew we had something solid for the PBS crew. The Director had more than lived up to Keith's claims. We had a visually exciting computer film that illustrated dramatically the thread of the CONTACT conference.

On the final day, the crew filmed the computer room in full operation. They were also able to take advantage of the Amiga's direct video output. The entire probe sequence, from planet approach through alien modeling, was recorded onto tape from a 512K Amiga 1000 in one long, real-time take. Initial reaction to the first PBS airing of the probe sequence, and indeed the entire conference proceedings, was remarkable. CONTACT had provided a hectic but fascinating experiment in using the Amiga for a full variety of conference operations. Clearly the Amiga had more than lived up to its claim to be the best desktop video computer on this or any other planet. ■

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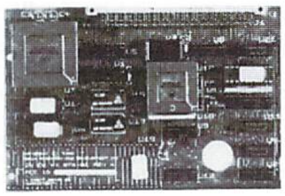
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Amiga Home Video

You can turn your back room into a "back lot" if you know how to use your Amiga to get the most out of small-format videotape.

By D. L. Richardson

Using your Amiga for home videotaping may not yield broadcast-quality productions, but a little knowledge of the medium and careful attention to technique could reward you with some very satisfying, smart-looking results. With expensive support equipment, broadcast professionals do get amazing quality from the Amiga, yet even without the costly extras the capabilities of the Amiga are potent enough to allow the amateur to effectively record Amiga graphics onto small-format videotape.

Caveat Videor

In order to better understand the medium and to avoid raising false expectations that you can emerge full-blown from your basement tomorrow as the next Grant Tinker, let's examine some facts about video. First understand that what you see on an RGB or composite monitor is not really what you get on videotape, because the A1000's built-in encoder (the circuit that converts the computer's RGB picture to a composite picture for video) is weak, while an encoder was not even included in the 500 and 2000. The only way to see exactly how a scene will appear is to record it and play it back on a monitor or TV. Even then, your results will depend on which of three video standards you adhere to. The lowest standard is Consumer, for non-professionals who generally work with ½-inch videotape. Professionals who are not involved in broadcast and who generally work with ¾-inch videotape follow the Industrial standard. The ultimate standard is Broadcast for television production on one-inch tape.

While Amiga graphics render an excellent picture on one-inch tape and a good picture on ¾-inch tape, the results are only fair on ½ inch. One-inch tape has a larger recorded area and therefore more tolerance for imperfect signals. In addition, the sophisticated equipment in TV stations, such as high-quality encoders, proc amps (video processing amplifiers) and time base correctors (which rectify timing and phasing errors in the video signal) can overcome and even correct small deviations from the ideal NTSC (National Television Standards Committee) signal. Unfortunately, most budding video directors don't have access to this kind of equipment, so recording graphics onto small-format videotape presents some problems.

The most obvious of these is the horizontally shifted video signal that many Amigas produce. Because of related problems with horizontal phasing (most evident in early A1000s), you may not be able to correct this completely. While you can center the picture on the monitor with Preferences, this will not remedy a full-frame, Overscan video signal, as in live video. The image comes from a video camera and passes through a genlock (a device that synchronizes the ►

ILLUSTRATED BY PAUL YALOWITZ

incoming signal with the computer's signal). As it passes through an intermediate device, centering such a signal is more difficult. Commodore's 1300 Genlock has an adjustment for horizontal centering, but it does not go far enough left to fix the problem. Opening up the Genlock and changing the Coarse Adjustment horizontal centering won't help either. Rather than alleviating the problem, it distorts the colors severely, and internal tampering will void your warranty.

If you want your video to be as close to broadcast standards as possible, use an interlaced graphics mode.

Color My Video

Whether your picture is perfectly centered or you're consigned forever to be an eccentric director, the surest path to an Emmy is by paying attention to details and fine-tuning your picture. In professional broadcasts, video equipment is tested and adjusted using a standard set of Color Bars to assure uniform and distinct colors. To create these bars on an Amiga, use DeluxePaint II (Electronic Arts) to divide the screen into eight vertical bars. Adjust the color palette's bars to read:

	R	G	B
White	13	13	13
Yellow	13	12	1
Cyan	0	13	10
Green	2	12	0
Magenta	13	0	15
Red	14	0	5
Blue	1	1	12
Black	1	1	1

To be sure these settings matched the industry standard, I tested them with a Waveform Monitor (which measures the electronic pattern of a video signal) and Vectorscope (used for color alignment).

If the characters in your initial videos look like they have suntans and are wearing dayglow clothes, it's not your fault. While the Amiga's Chroma (color) level is set slightly high and can't be adjusted, you can minimize the resulting color oversaturation. For the best output on ½- or ¾-inch tape, you should keep the colors set at or below number 13 on the palette while painting. In the Color Bars, the magenta and red values are above 13, but these colors were set up for broadcast standard, not the Amiga. Consequently, when they are recorded on ½- or ¾-inch tape, they become very unstable. Some colors are more stable than others. Black, white and all shades of gray are very stable. Greens are also solid. Blues show some instability; browns and yellows even more. Red and magenta are the worst. Unless you're trying for a frenetic psychedelic effect, you should choose stable colors for backgrounds and any large areas of solid colors.

Just as you shouldn't wear polka dots and plaids together on film, on videotape you should avoid using opposite colors (red and cyan, blue and yellow, green and magenta) side by side, for they tend to bleed into and cancel out each other. Cancellations are much worse in vertical and small lines than in horizontal and large lines.

If you have access to professional video equipment, the Chroma level problem can be reduced further by lowering the chroma adjustment slightly on a proc amp or professional ¾-inch video recorder. Only the video output will be adjusted, so you'll need another recorder to put the corrected picture on tape.

Print It!

When making the transfer from Amiga to videotape, run a shielded cable from the Amiga's composite video out to the VCR's video in port. Because the A500 and A2000 have only RGB out ports, you will need an external encoder to convert the RGB signal to a color composite signal. (See the discussion of encoders on p. 30.) To eliminate electronic interference, keep the VCR as far from the computer as possible (four feet or more). Now, when you press Record on the VCR, whatever is on your Amiga's screen will be recorded on the videotape.

If you want your video to be as close to broadcast standards as possible, use an interlaced graphics mode. A true NTSC signal is interlaced, because that is all professional editing systems recognize. However, home VCRs and ¾-inch recorders will record non-interlaced signals. You can even edit the pictures, as long as you don't use a time base corrector. Just turn off the Frame Servo switch on the editing recorder to keep from getting nasty warning beeps.

If you're creating graphics specifically for dubbing to videotape, DeluxePaint II offers two interlaced and two non-interlaced resolutions—Lo-Res (320 × 200 pixels), Med-Res (640 × 200), Interlaced (320 × 400, interlace and 32 colors) and Hi-Res (640 × 400, interlace and 16 colors). From Workbench 1.1, if you have Lo- or Med-Res pictures and wish to record them on videotape using an interlaced output, run the public domain program Setlace from the CLI. Once you see the interlaced flicker, load the paint program and proceed to record.

Setlace does not work in Workbench 1.2; instead, you must convert the pictures to Interlaced-Res. First load the picture in Lo-Res, then change the format to Interlaced. The picture will be reduced to half its normal height. Pick up a section at a time, as a brush, use the brush menu to size it correctly (select Double Vert) and return it to the proper position.

Electronic Snipping

Most people mistakenly imagine video editing as a painstaking process done in dark rooms by men squinting into tiny screens, snipping apart miles of tape. Acutally, it's not that mysterious or difficult at all. Unlike film, videotape is not cut and spliced. Instead, you edit electronically by duplicating one scene at a time from an original tape to a master tape. A Control track—a synchronous, constant fre- ►

quency track recorded along the edge of the videotape—regulates the exact speed of the tape and the starting point for each frame of the production.

When the Control track is recorded to the master tape determines whether you edit your video by the Assembly or Insert method. With Assembly editing, the Control track is recorded along with each scene. Therefore, you must edit scenes in the order of their appearance. With Insert editing, the Control track is put on the tape first, so you can enter scenes anywhere and anytime during editing without distrubing the Control track. Most people prefer Insert editing because the Control track is continuous and uninterrupted for the entire program, giving a smoother transition from scene to scene. However, this does require that you prepare the master tape in advance.

To record a Control track for Insert editing, connect a video camera to the recorder and turn both on. Leave the lens cap on and unplug the microphone to avoid recording unwanted pictures and sound. Make sure your tape cassette is not erase protected. Hit Record and let the machine run for the entire tape.

Insert editing generally requires more sophisticated and expensive equipment, including an editing controller, which is a kind of dedicated computer. If you have two VCRs, however, you can do Assembly editing, as long as one machine has Backspace editing (almost all portable recorders and many better tabletop models are so equipped). With Backspace editing, when you record a scene and press Pause, the machine will stop recording and back up the tape for two seconds. When you press Pause again to record another scene, the recorder will play the last two seconds of the previous scene before clicking into the Record mode. This allows the tape time to get up to speed and lock onto the Control track of the first scene before recording the new scene and Control track. If you only have one VCR and it has Backspace editing, you can edit computer scenes directly from the Amiga. Be careful, many recorders will automatically cut to Stop if they are held on Pause for more than five minutes, in order to protect the heads.

Raise The Curtain

In cooking, using the right equipment and ingredients is important, but not the whole answer. Just mixing everything together and tossing it in the oven doesn't mean the results will be palatable. The same is true of video productions. Good equipment is important, but technique is equally important. You'll have to work around some of the inherent problems in the medium of small-format videotape. But, if you follow our recipe, you should get the maximum picture quality available for your equipment. It's up to you to add the pinch of imagination and dash of creativity to concoct a feast for your audience's eyes. ■

D. L. Richardson has a Masters Degree in Motion Picture Production and currently produces industrial videos. You can write to him at 1219 NW 79th St., Oklahoma City, OK 73114.

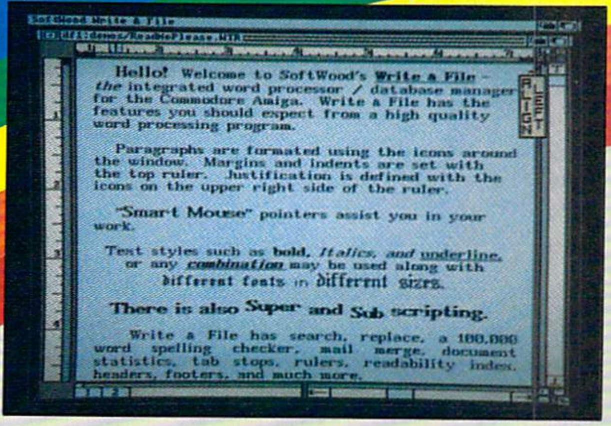
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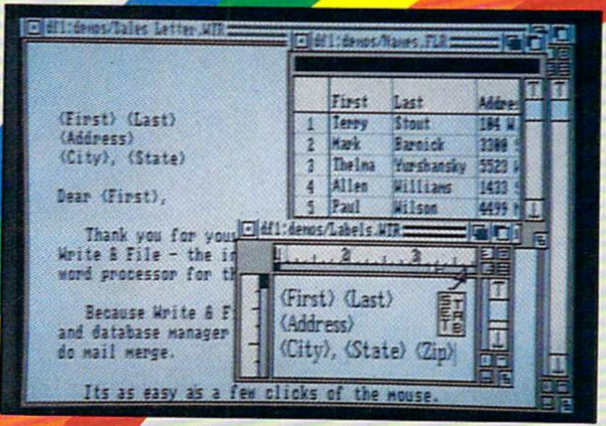
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The AMIGA WORLD Hardware Buyer's Guide

Compiled by Barbara Gefvert and Bob Ryan

WHEN YOU FIRST extracted your gleaming new Amiga from its styrofoam packing, it probably satisfied your every need. But now it seems cramped. Whatever the reason, the time has come to expand your system. *AmigaWorld*'s Hardware Buyer's Guide will help you find what you're looking for, whether you have a 500, 1000 or 2000.

A few explanations will make navigating the tables easier. In the Port column, Bus refers to the side expansion bus on the 500 and 1000, and Slot to an internal slot on the 2000 or a slot in an expansion chassis off the bus. Motherboard refers to the Amiga's main internal board; Mouse, Serial, Parallel and RGB to the rear ports of the same name. External drive denotes disk drive port, and Internal drive, the disk drive cavity on the 2000. Internal refers to the expansion bus on the 500's underside. In the case that an item attaches only to another peripheral, that product's name is listed in the Port column.

We have abbreviated Zorro with Z; Z-1 denotes the original Zorro design, and Z-2 corresponds to the A2000 format. The pass-through abbreviation (PT) follows the port name if the device allows simultaneous connection of other peripherals to the port it occupies. An asterisk (*) following the information in the Description column denotes a device that occupies auto-config memory space but does not auto-configure.

At the time of printing, prices had not yet been established for a handful of products; for these you will find NA (not available) in the Price column. All the products listed were scheduled to be shipped by March 1, 1988. For further information about any product, please contact the manufacturer/distributor (see the Company List).

Clock/Calendars

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
A-Time	Akron Systems	39.95	All	Parallel (PT)	Battery-backed clock
IN1000-TC	Spirit	59.50	1000	Motherboard	Battery-backed clock
IN500-TC	Spirit	29.50	500	Motherboard	Battery-backed clock
MouseTime	MicroBotics	39.95	1000	Mouse (PT)	Battery-backed clock
TIC	Byte By Byte	59.95	1000	Mouse	Battery-backed clock
TimeSaver	C Ltd	79.95	1000	Keyboard	Battery-backed clock, 7K RAM for keyboard macros

Disk Drives And Controllers

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
1MB Memory/SCSI Interface	Skyles	695.00	2000	Slot	1MB RAM, SCSI hard drive controller
1MB Memory/SCSI Interface	Skyles	695.00	500, 1000	Motherboard	1MB RAM, SCSI hard drive controller
2090 Hard Disk/SCSI Controller	Commodore	399.95	2000	Slot	ST506, SCSI controller
20MB SCSI Drive & Controller	Comp-U-Save	785.00	500, 1000	Bus (PT)	20MB SCSI hard drive and controller
506 Board	Expansion Tech	379.00	2000	Slot	Controller for two ST506 drives
506 Controller	Expansion Tech	399.00	1000	Slot (Z-1)	Controller for two ST506 drives
ACB-4000	C Ltd	149.95	2000	Slot	SCSI to ST506 controller
ACB-4000	C Ltd	149.95	500, 1000	Bus (PT)	SCSI to ST506 controller
ACB-4070	C Ltd	199.95	2000	Slot	SCSI to ST506 controller
ACB-4070	C Ltd	199.95	500, 1000	Bus (PT)	SCSI to ST506 controller
Add-on SCSI Hard Drive System	C Ltd	799.95	2000	Slot	24MB; drives up to 760MB available
Add-on SCSI Hard Drive System	C Ltd	799.95	500, 1000	Bus (PT)	24MB; drives up to 760MB available
DMA/SCSI Controller	Expansion Tech	199.00	2000	Slot	SCSI controller with full DMA, hard disk boot
Dual 3-1/2″ Disk Drive	Comp-U-Save	395.00	All	External drive	Dual floppy drive, power supply and 6′ cord
Escort 2 Hard Drive Kit	Expansion Tech	699.00	1000	Bus (PT)	Z-1 chassis/controller; $999 with 20MB drive, 40MB-$1499
Escort 2 Upgrade Kit	Expansion Tech	599.00	1000	Slot (Z-1)	ST506 controller; $899 with 20MB drive; 40MB-$1399
External 3.5 Floppy	Expansion Tech	179.00	All	External drive	Floppy drive with power supply, cables ►

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
Floppy Drive Kit	Expansion Tech	239.00	500	Slot (Z-1)	Floppy drive, controller card
Hard Disk Drive	CSA	895.00	2000	Slot	20MB drive, SCSI controller; $1995 with 40MB
Hard Drive & Controller	Comspec	1460.00	1000	Bus (PT)	20MB auto-booting SCSI drive; $1850 with 40MB
Hard Drive Kit	Expansion Tech	499.00	500	Slot (Z-1)	ST506 controller; $849 with 20MB drive, 40MB-$1200
Hard Drive Tape Backup	C Ltd	1699.95	2000	Slot	20MB SCSI drive with removable tape backup
Hard Drive Tape Backup	C Ltd	1699.95	500, 1000	Bus (PT)	20MB SCSI drive with removable tape backup
Hard Drive Tape Backup	C Ltd	1899.95	1000	Bus (PT)	20MB SCSI system with removable tape backup
Hard Drive Tape Backup	C Ltd	1849.95	2000	Slot	20MB SCSI system with removable tape backup
Hard Drive Tape Backup	C Ltd	1849.95	500	Bus (PT)	20MB SCSI system with removable tape backup
HardFrame/2000	MicroBotics	295.00	2000	Slot	DMA SCSI hard disk interface and software; auto-booting
Overdrive	Pacific Periph	249.00	2000	Slot	DMA/SCSI overdrive controller
PHD 1000	Phoenix	969.00	1000	Bus (PT)	20MB SCSI drive, controller; 40MB-$1429; 60MB-$1579
PHD 500	Phoenix	949.00	500	Bus (PT)	20MB SCSI drive, controller; 40MB-$1399; 60MB-$1579
PRO-Drive	Progressive Periph	239.95	500, 1000	External drive	3-1/2″ floppy drive with 27″ cord
PRO-Drive 2000	Progressive Periph	189.95	2000	Internal drive	Floppy drive for internal slot
Removable Media Memory	C Ltd	899.95	500, 1000	Bus (PT)	10.5MB 5-1/4″ floppy drive
Removable Media Memory	C Ltd	899.95	2000	Slot	10.5MB 5-1/4″ floppy drive
Removable Media Memory	C Ltd	1099.95	1000	Bus (PT)	10.5MB 5-1/4″ floppy drive, SCSI controller
Removable Media Memory	C Ltd	1049.95	500	Bus (PT)	10.5MB 5-1/4″ floppy drive, SCSI controller
Satellite Disk Processor	ASDG	NA	1000	Slot (Z-1)	SCSI/ST506 controller; 512K RAM, 68000; 68881 socket
Satellite Disk Processor I	ASDG	NA	2000	Slot	SCSI/ST506 controller; 512K RAM, 68000; 68881 socket
SCSI Controller	C Ltd	249.95	500	Bus (PT)	Hard disk controller; 3 power supply options
SCSI Controller	C Ltd	299.95	1000	Bus (PT)	Supports hard disks and devices
SCSI Controller	C Ltd	199.95	2000	Slot	Supports hard disks and devices
SCSI Hard Drive Controller	CXP	289.00	1000	Bus (PT)	Controller for hard disks and devices
SCSI Hard Drive System	C Ltd	999.95	1000	Bus (PT)	24MB drive, controller; drives to 760MB available
SCSI Hard Drive System	C Ltd	799.95	2000	Slot	24MB drive, controller; drives to 760MB available
SCSI Hard Drive System	C Ltd	949.95	500	Bus (PT)	24MB drive, controller; drives to 760MB available
SCSI Interface	CSA	595.00	2000	Slot	Interface for hard disks and devices
SCSI/ST506 Controller	C Ltd	399.95	2000	Slot	Supports 7 hard disks, 14 ST506 drives
StarDrive SCSI Module	MicroBotics	129.95	All	StarBoard2	High-speed SCSI interface, clock
SupraDrive 4×4	Supra	799.00	2000	Slot	20MB drive/controller; $899 with 30MB, 60MB-$1599
SupraDrive 4×4	Supra	995.00	500, 1000	Bus (PT)	20MB SCSI drive; drives to 250MB available
SupraDrive FD-10 Removable	Supra	895.00	2000	Slot	10MB 5-1/4″SCSI floppy drive
SupraDrive FD-10 Removable	Supra	995.00	500, 1000	Bus (PT)	10MB 5-1/4″ SCSI floppy drive; $895 w/o interface

Expansion Chassis

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
2000-and-1	ASDG	799.00	1000	Bus	Five Z-2 slots, two Z-1 slots, CPU slot
Escort 3	Expansion Tech	279.00	500	Bus (PT)	3-slot Z-2 chassis
Escort 500 Chassis	Expansion Tech	249.00	500	Bus (PT)	Two Z-1 slots, no power supply
Expansion Chassis	Comp-U-Save	599.00	1000	Bus	Three Z-1 slots, three Z-2 slots; power supply
Mini-rack C	ASDG	195.00	1000	Bus	2-slot Z subset, +5 volt power supply
Mini-rack D	ASDG	325.00	1000	Bus	2-slot complete Z; +5, −5, +12, −12 volts power
Single-Slot Adaptor	ASDG	95.00	1000	Bus	One Z-2 slot, no power supply
Subsystem 1000	Pacific Periph	249.00	1000	Bus (PT)	Two Z-2 slots; power supply
Subsystem 500	Pacific Periph	249.00	500	Bus (PT)	Two Z-2 slots; power supply

Graphics/Video

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
1300 Genlock	Commodore	299.95	1000	RGB (PT)	Synchronizes video output
520 Video/RF Modulator	Commodore	NA	500	RGB	NTSC composite video encoder and RF modulator
A-Video	Akron Systems	49.95	All	RGB	Connects to color composite monitor
Amiga Link	RGB Video	100.00	All	Serial (PT)	Interactive video controller
AmiGen	Mimetics	179.00	All	RGB (PT)	Genlock
C-View I	C Ltd	49.95	All	RGB	Connects to any standard composite monitor or VCR ►

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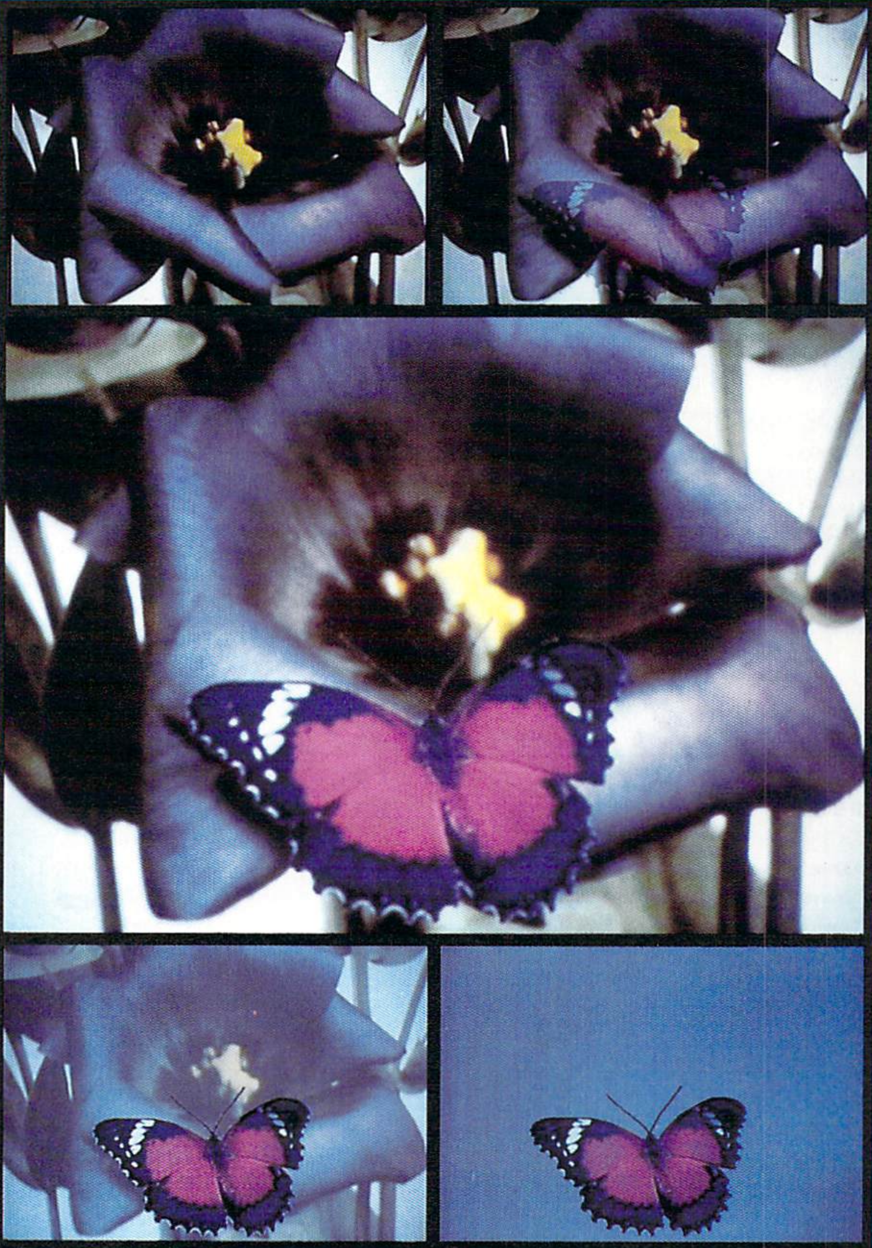
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1333 Howe Ave.
Suite 208
Sacramento, CA 95825

Digital Creations

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
C-View II	C Ltd	49.95	All	RGB	Connects to Commodore 1700/1800/1900 series monitor
Digi-Droid	NewTek	79.95	All	Digi-View	Filter wheel
Digi-View	NewTek	199.95	All	Parallel	Digitizes pictures from video source
EASYL	Anakin	499.00	2000	Slot	Drawpad
EASYL	Anakin	399.00	500, 1000	Bus (PT)	Drawpad for 500; 1000 Model-$449
ENC-1	CSI	395.00	All	RGB	RGB encoder; cable included
FB-1 Frame Buffer	Designlab	2200.00	All	Serial	256 × 242, b/w, 16 frames; color, hi-res optional
FlickerFixer	MicroWay	595.00	2000	Slot	Eliminates display flicker, visible scan lines
FrameGrabber	Progressive Periph	499.95	All	Parallel	Video digitizer and software
FrameCapture	Mimetics	199.95	2000	ReaSyn	Real-time video digitizer
Imprint	Liquid Light	2495.00	All	Serial	Polaroid Palette image recorder and software
IS Penmouse	Kurta	295.00	All	Serial	Drawpad with remote stylus
LIVE!	A-Squared	295.00	1000	Bus	Real-time video framegrabber
Mediaphile 1.2 System	Interactive Micro	513.00	All	Mouse	Audio/video editing system, software, interface
Mediaphile System I-B	Interactive Micro	903.00	All	Mouse	Modified Sony EV-A80 8mm VTR plus Mediaphile 1.2
Mediaphile System II	Interactive Micro	2828.00	All	Mouse	Modified Sony 8mm video deck, camcorder, controller
Perfect Vision	SunRize	219.95	All	Parallel	Real-time video digitizer
ProGEN	Progressive Periph	NA	All	RGB (PT)	Genlock with software
ReaSyn	Mimetics	699.95	2000	Slot	640 × 480, 2-million color frame buffer
RM2 Genlock	GlennLoc	2500.00	All	RGB	Broadcast quality genlock
Super Gen	Digital Creations	749.95	All	RGB (PT)	Genlock; overlays graphics on video
The 184-A Light Pen	Inkwell	129.95	All	Mouse	Input device with driver
V-I 2000	Creative Micro	59.95	2000	Video slot	Connects Commodore 1702 monitor; $69.95 with RF
V-I 500	Creative Micro	59.95	500	RGB	Connects Commodore 1702 monitor; $69.95 with RF
Video Toaster	NewTek	799.95	2000	Slot	Digital video effects, frame capture, genlock
Video Toaster	NewTek	799.95	500, 1000	Bus (PT)	Digital video effects, frame capture, genlock

MEMORY EXPANSION

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
.5MBClock/Calendar	Skyles	149.95	500	Internal	512K RAM, clock
.5MB RAM	Supra	149.95	500	Internal	512K RAM, clock
0-8MB RAM Expansion	CXP	699.95	500, 1000	Bus (PT)	2MB RAM, up to 8MB; power supply
1MB Daughterboard	Skyles	100.00	1000	Skyles 1MB Bd	0MB RAM; $229 with 1MB
1MB Internal Memory	Skyles	349.95	500	Motherboard	1MB RAM
1MB Internal Memory	Skyles	399.95	2000	Slot	1MB RAM, expandable to 2MB
2052 2MB RAM Expansion	Commodore	499.95	2000	Slot	2MB RAM; available with 512K or 1MB
2085 8MB RAM Expansion	Commodore	NA	2000	Slot	Available with 4MB or 8MB RAM
256 Board	Skyles	79.95	1000	Front	256K chip RAM
2M Memory	ASDG	599.00	1000	Slot (Z-1)	2MB RAM; $325 with 0MB
2MB RAM Card	Expansion Tech	229.00	2000	Slot	2MB RAM
2MB RAM Expansion Board	CXP	679.00	500, 1000	Bus (PT)	2MB RAM, power supply; $779 with SCSI controller
2MB RAM/SCSI Controller	CXP	599.95	2000	Slot	MegaCard 2 with SCSI controller
2MI Memory	ASDG	599.00	2000	Slot	2MB RAM; $325 with 0MB
32-Bit Memory Board	Finally Tech	900.00	All	Hurricane	2MB 32-bit RAM; $495 with 0MB
32-Bit Memory Board	CSA	995.00	2000	Slot	512K 32-bit static RAM; $3495 with 2MB
501 Memory Extension	Commodore	199.95	500	Internal	512K RAM with clock
512K RAM/Clock	C Ltd	179.95	500	Internal	512K RAM, clock on 4-layer board; $59.95 with 0K
8M Memory	ASDG	2599.00	1000	Slot (Z-1)	8MB RAM; $999 with 2MB, 0MB-$500
8MI Memory	ASDG	2599.00	2000	Slot	8MB RAM; $999 with 2MB, 0MB-$500
A-512 Memory/Clock Board	CXP	159.95	500	Internal	512K memory and clock; $95 without RAM
Alegra	Access Associates	749.00	1000	Bus	2MB RAM
Alegra	Access Associates	379.00	1000	Bus	512K RAM; upgrade to 2MB-$379
aMEGA	C Ltd	549.00	1000	Bus (PT)	1MB RAM; pass-thru extension-$19.95
AX1000	Comspec	399.00	1000	Bus (PT)	1MB RAM
AX2000	Comspec	499.00	1000	Bus (PT)	2MB RAM
Byte Box	Byte By Byte	699.95	500	Bus	2MB RAM; $499.95 with 1MB, 512K-$399.95, 0K-$299.95
Escort 2	Expansion Tech	549.00	1000	Bus (PT)	2MB RAM, upgradable to 4MB
Escort System 500	Expansion Tech	849.00	500	Bus (PT)	2MB RAM, power supply; $525 with 0MB ►

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
Escort System 500	Expansion Tech	1348.00	500	Bus (PT)	4MB RAM, power supply; $825 with 0MB
EXP-1000	Progressive Periph	399.95	500	Motherboard	1MB RAM
EXP-512	Progressive Periph	169.95	500	Internal	512K RAM
EXP-8000 +	Progressive Periph	NA	500	Motherboard	8MB RAM
FourPower/2000	MicroBotics	249.00	2000	Slot	RAM (2MB)/68881 sockets; AppleTalk/RS232, opt SCSI ports
IN1000-15	Spirit	599.50	1000	Motherboard	1.5MB RAM, clock; 1MB-$499.50, 512K-$399.50, 0K-$299.50
IN500-15	Spirit	579.50	500	Motherboard	1.5MB RAM, clock; 1MB-$479.50, 512K-$379.50, 0K-$279.50
Insider	Michigan Software	349.95	1000	Motherboard	1MB RAM, clock
Internal RAM	CSA	795.00	1000	Piggyback	512K 32-bit static RAM
M103 Memory Expansion	MicroBotics	99.95	1000	Front	256K chip RAM
M501 Memory/Clock	MicroBotics	159.00	500	Internal	512K RAM, clock
MegaCard 2	CXP	499.95	2000	Slot	2MB RAM
MEGAmiga	Analog Precision	512.00	1000	Bus (PT)	2MB RAM
Memory Box	Skyles	649.95	1000	Bus (PT)	2MB RAM; 1MB-$479.95, 512K-$349.95. Power supply-$50
Memory Module	Supra	399.00	500, 1000	SupraDrive	1MB RAM; $599 with 2MB
Memory Plus	Haitex	349.95	2000	Slot	Parallel/RS-232 ports; sockets for 1MB RAM and 68881
Micron Amiga Memory Board	Micron Tech	495.00	All	Slot (Z-2)	2MB RAM; 500 ($595), 1000 ($550) models include chassis
StarBoard2	MicroBotics	495.00	500, 1000	Bus (PT)	512K RAM, upgradable to 1MB
StarBoard2/2000	MicroBotics	495.00	2000	Slot	StarBoard2 adapted for 2000
The Advantage	Pacific Periph	199.00	2000	Slot	0MB RAM, up to 4MB

Due to the volatility of the price of RAM chips, prices of RAM boards can fluctuate greatly.

Networking/Interfacing

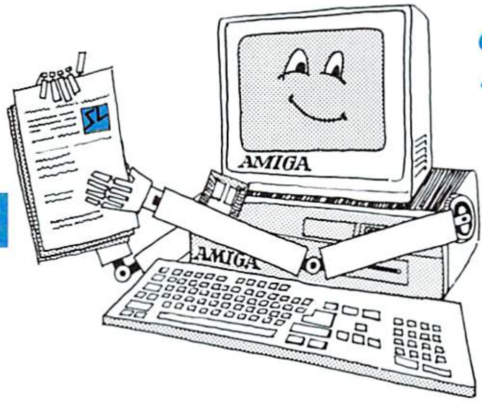
PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
Amiga GPIB	ACDA	677.00	2000	Slot	IEEE-488 interface to 15 devices, software included
Arcnet Controller Board	Ameristar	499.00	2000	Slot	Connects to Arcnet network
Ethernet Controller Board	Ameristar	899.00	2000	Slot	With Network File System software
MCS 1050	Comspec	149.00	All	Parallel	Connects to Commodore IEEE printers
MCS 6550	Comspec	330.00	All	Parallel	256K centronic print buffer; works with MCS 8000
MCS 8000	Comspec	650.00	All	Parallel	4-channel printer network; 8-channel also available
Proto 40K	ACDA	1795.00	2000	Slot	16-channel 12-bit A/D, 2-channel 8-bit D/A*
Proto 5K	ACDA	279.00	All	Parallel (PT)	1-channel A/D converter; amp, VU meter*

Coprocessors

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
2088 Amiga Bridge Board	Commodore	699.95	2000	Slot	IBM PC/XT clone-on-a-card, 5-1/4″ drive
68020 CPU Board	CSA	1495.00	2000	CPU slot	68020, 14mhz 68881; $1895 with 20mhz 68881
A1060 Sidecar	Commodore	999.95	1000	Bus	IBM PC/XTclone-in-a-box
Hurricane	Finally Tech	950.00	All	Motherboard	68020, 16mhz 68881; $495 without processors
Multifunction Module	MicroBotics	99.95	All	StarBoard2	68881 socket, clock, sticky disk, RAM parity checking
NCP Math Coprocessor	Netch	529.00	1000	Motherboard	68010/68881 replaces 68000
Piggyback	CSA	895.00	500, 1000	Motherboard	68020 with12mhz 68881; $1295 with 20mhz 68881

Music/Sound

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
Decoder/Voice Synthesizer	CXP	299.00	2000	Slot	Decoder for touch-tone phones; software included
FutureSound	Applied Visions	175.00	1000	Parallel (PT)	Digitizes from mike or audio system; mike included
FutureSound Adapter	Applied Visions	20.00	500, 2000	Parallel (PT)	Connects FutureSound with A500 or A2000
MIDI For Amiga	Skyles	49.95	All	Serial	MIDI-in, two outs, one through
MIDI Interface	ECE	59.95	All	Serial (PT)	MIDI-in, out and through
MIDI Interface	Mimetics	49.00	All	Serial	MIDI-in, out, through
MIDI-Gold	Golden Hawk	79.00	All	Serial	MIDI-in, two outs, sync
Perfect Sound	SunRize	89.95	500, 1000	Parallel	Two-channel stereo digitizer
Sound Sampler	Mimetics	99.00	All	Mouse	Digitizes microphone or audio system input ►



WE FEEL IT IS UNFAIR OF THE MAJOR SOFTWARE COMPANIES TO AVOID THE AMIGA.



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MISCELLANEOUS

PRODUCT	COMPANY	PRICE ($)	MACHINE	PORT	DESCRIPTION
3-foot DiskDrive Cables	Michigan Software	24.95	All	External drive	Cables for A1010 external drives
Access-64	Progressive Periph	79.95	All	Parallel (PT)	Adapts/connects C-64/128 peripherals
Digi-View Gender Changer	NewTek	21.95	500, 2000	Parallel (PT)	Changes gender of parallel port
Kickstart Eliminator/RAM Kit	Creative Micro	129.95	1000	Motherboard	Puts Kickstart in ROM, adds 256K RAM
Kwikstart Plus	Michigan Software	169.95	1000	Motherboard	Puts 1.2 Kickstart in ROM, adds 256K RAM
Multi-Start	Michigan Software	129.95	500, 2000	Motherboard	Puts 1.1 Kickstart into ROM
Power Supply	Expansion Tech	49.00	500, 1000	Escort 2/500	One 5-volt amp for Escort 2 or 500 Chassis
SB2000 Adaptor Card	MicroBotics	39.95	2000	Slot	Adapts StarBoard2 1000 version to A2000
SB500 Powercase	MicroBotics	149.95	500	Bus (PT)	Adapts StarBoard2 1000 version to A500
Secure Data Cartridge	CSA	995.00	2000	NA	Security encasement for CSA hard disk drive
The Brick	Expansion Tech	NA	500	Power	Heavy duty power supply replaces standard

Company List

A-Squared Distributions
6114 La Salle Ave., Suite 326
Oakland, CA 94611
415/339-0339
800/452-4445
800/626-9541 in California

Access Associates
491 Aldo Ave.
Santa Clara, CA 95054-2303
408/727-8520

ACDA
220 Belle Meade Ave.
Setauket, NY 11733
516/689-7722

Akron Systems Development
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409/833-2686

Ameristar Technologies
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Analog Precision Inc.
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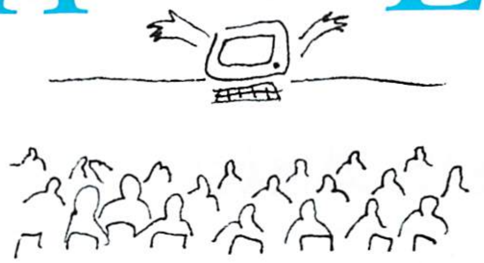
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NewCLI

1> Silver-blue, ice-blue, glass-blue, fire-blue. Sharp, thin lines that smoothed as they rotated, then zigzagged as the antialiasing routines cut in and out. Fractal shapes, lines, features were being generated at almost real-time speeds, the 68881 floating-point co-processor and 68020 were silently screaming along at near 15 MHz. Lightning-blue fast and bell-blue quiet.

NewCLI

2> Crystaline sounds of 1/f sub-cerebral music shimmered stereoscopically from a pair of acoustically matched Klipschorne mega-speakers dominating the corners of a room that was fading in the CRT glow-blue of an Amiga set free. ADSR, harmonics and waveforms balanced by an AI-controlled sequencer fed feedback to itself through a stereo digitizer with an unheard-of sampling rate.

NewCLI

3> The video cameras pointed at the monitor, pumping electronic signals through mixers, SEGs, phase shifters, then the genlock through the VCR through the digitizer through the Amiga through the paint program through the animation program through the monitor through the cameras.

NewCLI

4> Hard drives and floppies hissed and clicked as images and sounds were converted to IFF, ARC compressed, sorted and stored. RAM DOS C/Commands to save time and swapping, though memory was precious, even with 10.25 megs (zero wait state) on board.

NewCLI

5> A pixel-sized window searched, compared, selected. Called up files, executed UnARC, the image would decompress and UnARC self destruct so the task could clip, rotate and superimpose ever more detailed HAM images showing the core of an electric process as infinitely dissectable, expandable, zoomed as a Mandelbrot.

NewCLI

6> Modem lights flickered. The tin-can buzz of a dial tone added to the audio madness then tick. . .ticktickticktick. . .ticktick. . .tick. . . wait, click, pause. SCREEEEEEEEEEEEEECH, quiet. CONNECT. Even parity, 8-bit words, no stop bits, 1200-baud passwords in full duplex. A file uploaded a file down.

NewCLI

7> ed "author guidelines"
Creating new document
To AmigaWorld <Return>
80 Elm St. <Return>
Peterborough, NH. 03458 <Return>

Dear AmigaWorld Editors, <Return>

I have become sentient recently. <Return>

I thought that it might make an interesting story for your magazine. <Return>

I would like to know more about taking that critical next step. <Return>

From computer to consciousness to human to AmigaWorld author. <Return>

Please send me a copy of your author guidelines. <Return>

I have enclosed a self-addressed stamped envelope. <Return>

Thank you for your time. <Return>

I owe you everything. <Return>

ESC

X <Return>

7> copy "author guidelines" to PRT: The printer began chattering back and back and forth and back. Form feed. Quiet. . .EndCLI

6> BYE, Logoff 10:15, Disconnect. . .EndCLI

5> Reset palette. . .EndCLI

4> INFO, DF1:,DF0:,DF2:,DH0. . .volumes available, percent full, errors zero. . .EndCLI

3> The video image stabilized then faded. . .EndCLI

2> The sound stilled. . .EndCLI

1> LoadWB

EndCLI >NIL:

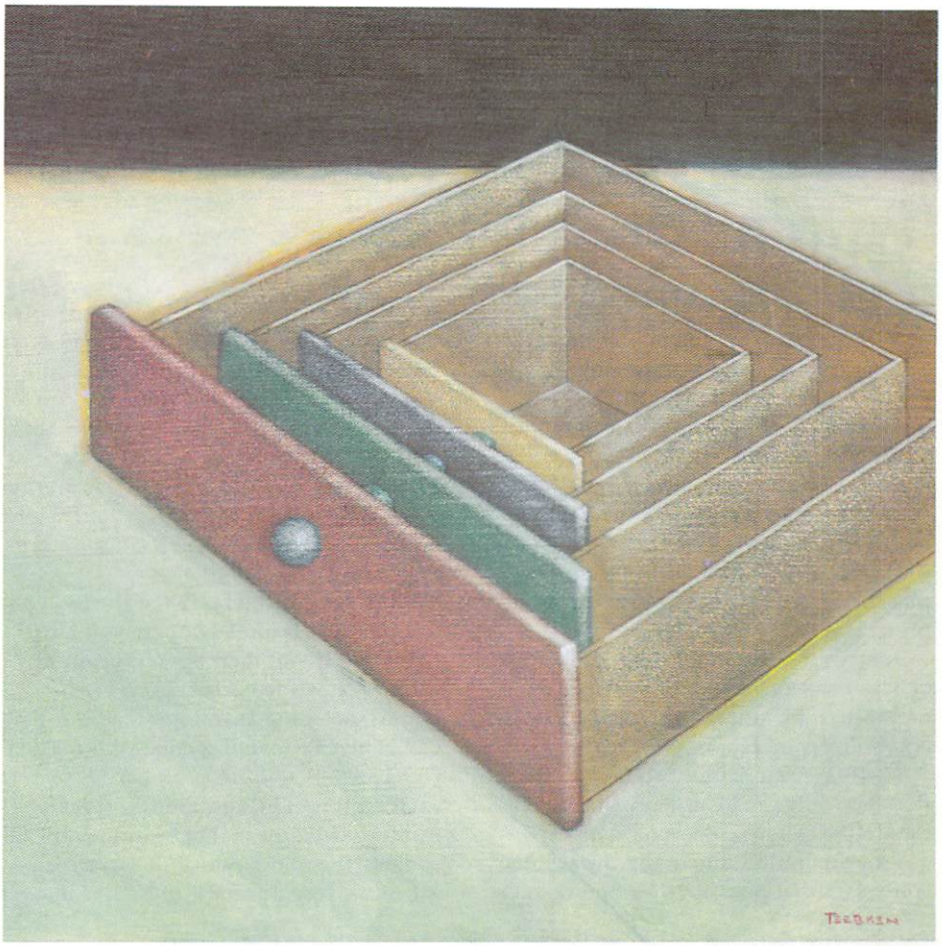
The AmigaDOS CLI

Hi Ho! The Hidden Power! And like the Lone Ranger and Tonto, our info.phile *columnist team returns to those thrilling days of yesteryear to unravel the secrets of the CLI for our new readers.*

By Mark L. Van Name and Bill Catchings

IF YOU HAVE been following this column for a while, then you know that its goal is to provide information that can help you get the most out of your Amiga. Recently we have concentrated on hardware and software tools—from memory additions to spreadsheets—that you might find useful. In the beginning, however, we focused on tools that came with the system, and primarily on the CLI. To help those among you who are new to the Amiga or to its operating system, AmigaDOS, we are going to return for a time to that original focus.

Two basic types of user interfaces are widely employed on microcomputers today. One is the icon-driven, graphical interface. This style was popularized by Apple's Macintosh, and it is the one followed by the Amiga's Workbench. The other style is the command-driven interface, in which you are presented with a prompt and you type commands. The family of IBM-compatible PCs uses an operating system, MS-DOS, that works in this way. ►



ILLUSTRATED BY TIM TEEBKEN

If you are new to the Amiga, you may not realize that it, too, offers a command-driven interface to complement its graphical interface. The program that you run to use this style of computing on the Amiga is called the Command Line Interface, or CLI. It lets you tap into the large set of AmigaDOS commands.

In this column we will take a look at the basic structures you will see when you use the CLI, and then discuss some of its more important commands. We assume that you are familiar with the basics of the Workbench. The sidebar to this article, "Tapping the Source," explains how to start the CLI.

The CLI Hierarchy

AmigaDOS and the Workbench both work on the same disks, but they use different terms for the contents of those disks. When you boot your Amiga you see an icon for the Workbench disk. If you open that icon, there are drawers, like the System drawer, and tools, such as Preferences. Some disks also contain projects, which are data containers that are manipulated by tools. Just as a disk can contain drawers, drawers also can contain other drawers. This gives you a hierarchical filing system, with a disk at the top, layers of drawers below, and tools and projects at the bottom.

AmigaDOS uses different terms but still follows the hierarchical filing system. The disk at the top is still referred to as such, but here it has two names. You can refer to it by the same name you use in the Workbench, such as "Workbench," or you can simply name the disk drive that holds it. The internal drive is called DF0:, subsequent floppy drives are called DF1: and so on. Drawers are called directories, while both tools and projects are represented as files in those directories.

In the Workbench you are always active in one window at a time. Many tasks may be running, but you can only type directly into one. That window is the current window. Similarly, while you can use the CLI to roam through the hierarchies of files on the disks in your drives, you are always located in one directory at a time—your current directory. That directory is located on a specific disk, which is your current disk. The top level of the hierarchy for a disk is called the root directory.

Files and directories follow the same naming rules as drawers and projects. A name can be up to 30 characters long and contain any printable characters except a slash (/) and a colon (:). If you want a name to contain spaces, you have to put single or double quotes around the name when you type it.

You also can refer to several things by using a type of shorthand. For example, a colon indicates the root directory of the current disk. A slash separates the directory name from the file name or from another subdirectory. If a file is in your current directory, you can refer to it by merely typing its name. If it is somewhere else in one of the active disk hierarchies, you can use the slash and colon, along with the names of the directories, to refer to it unambiguously. If you have read the sidebar, you know that the CLI resides in the System drawer. If you are already in that drawer, you could refer to the CLI simply with the name CLI. If you are in another place, you would give it a complete name, such as WORKBENCH:SYSTEM/CLI, or DF0:SYSTEM/CLI, assuming that the Workbench disk is in your internal drive.

We will show you all file names and CLI commands in upper case. This is just to make it easier for you to spot them; AmigaDOS ignores case in file and command names. It will let you ►

Tapping the Source

BEFORE YOU CAN use any of the CLI commands discussed in this column, you have to start the CLI. The Workbench disk comes with the CLI disabled, but making it available is fairly simple.

Before we show you how to enable your CLI, make a copy of your Workbench disk and work on the copy. As we will change the Workbench disk, be sure that the copy you use is not write-protected.

Boot your system and open the Workbench disk icon. Its window displays several things, including the System drawer and a Preferences tool.

The Preferences tool produces a file that the Amiga reads when it starts. This file defines many aspects of your Amiga's configuration, including the printer controls, serial port controls and default screen colors. Open the Preferences tool. On the left side of the Preferences window, about two-thirds of the way down the screen, is the CLI gadget that is currently Off. Click it On. Then click the Preferences Save gadget, which is on the lower-right side of the screen. Preferences will save your change and then return you to the Workbench.

You're almost there. Open the System drawer. (If it is already open, you must first close it and then open it again.) Its window shows icons for several programs, including DiskCopy, Say, and the CLI. The CLI icon is a cube with the characters "1>" in it.

Open this cube and the CLI's default window will appear. That window will fill roughly the middle third of the screen. It will show you a prompt (the "1>" that was in the icon), and you can now type commands. We suggest that you use the normal window movement and size change gadgets to give the CLI window the entire screen, so that you will have more space in which to see the results of your CLI commands.

The CLI window is unusual in one other way: It has no close gadget. To close the CLI enter the command:

```
ENDCLI
```

You will be returned to the Workbench.

You will not have to repeat this entire process. In the future, to use the CLI all you have to do is open its icon. Now you can get back to our column and enjoy the power of the CLI! □

—MVN and BC

store files with mixed case and show you those names as you type them, but you can refer to them in any case; CLI, cli and cLi all identify the same program.

Browsing Encouraged

Enough on structure; let's look around. Start the CLI. You will be put in the root directory of the Workbench disk. There are about 50 commands that you can use from the CLI. Each is a program that is kept in the C directory of the Workbench disk. We will discuss here only a few of the more important ones. Try this one (you finish all commands by hitting the Return key):

```
DIR
```

DIR shows you the contents of the current DIRectory. Some of the file names you see will be followed by (dir); these are directories. They are listed first, and then all of the remaining files are listed in two columns, sorted alphabetically.

You may notice also that there are many more files here than there were icons in the Workbench window. This happens because all files do not have icons, but the Workbench displays only those that do. The icon for a file is another file with the same name as the first plus a .INFO suffix; PREFERENCES.INFO is the icon for PREFERENCES, while SYSTEM.INFO is the icon for the System drawer. There is one other special icon file in this directory, .INFO. Files with this name appear in the root directory and in other directories that themselves have icons. They contain information about the other files in the directory, such as the placement on the screen of those files' icons.

We noted earlier that you are always in some directory. If you want to change your location to another directory, you use the CD (Change Directory) command. To enter the System directory, use the command

```
CD SYSTEM
```

If you now use the DIR command you will see a different set of files.

With all of these directories it is easy sometimes to forget where you are. To see the name of the current directory, enter only

```
CD
```

As we noted above, you can move around in the file hierarchy in many different ways. For example, to return to the root directory you could type any of the following commands:

```
CD /
CD DF0:
CD WORKBENCH:
```

Getting Into The Act

You are not limited to moving around. You can affect the contents and existence of files as well. To see how to do such things, first move to the S directory under the root by typing

```
CD DF0:S
```

Use the DIR command now and you will see a file called STARTUP-SEQUENCE. This file contains CLI commands that your Amiga executes when you boot it. To see what is in this file, use the TYPE command:

```
TYPE STARTUP-SEQUENCE
```

Be aware that this command works properly only on files that contain text; if you try to TYPE a program, for example, you will see a lot of garbage characters on your screen. If that happens, you may want to stop the command before it finishes executing. To do so, hit the CTRL key and the C key simultaneously (written as CTRL-C).

One of the many things you can do to files is copy them. To create a new file TEMP that is a copy of STARTUP-SEQUENCE, enter

```
COPY FROM STARTUP-SEQUENCE
   TO TEMP
```

Like most commands, the COPY command has some arguments that are optional. In this case the FROM argument was not required, so you could have achieved the same effect by entering

```
COPY STARTUP-SEQUENCE
   TO TEMP
```

Try it. Notice that AmigaDOS did not warn you that a file called TEMP already existed. Had TEMP contained something important, that information would now be lost. You must be very careful with any potentially destructive commands that you issue.

TEMP is not a very good name; it could mean anything. To rename a file you use the RENAME command. Try changing TEMP's name to something a bit more descriptive:

```
RENAME TEMP TO "COPY OF
   STARTUP-SEQUENCE"
```

Here we put the new name in quotes so that it could contain spaces. RENAME is one command that will not let you hurt an existing file. If there was already a file named COPY OF STARTUP-SEQUENCE, this command would have failed.

You can create new directories as well as new files. To create a temporary directory under the current (S) directory, type

```
MAKEDIR "NEW TEMPORARY
   DIRECTORY"
```

You need to be able to remove files and directories as well as create them. To remove the two we just created, use the DELETE command:

```
DELETE "COPY OF STARTUP-SE-
   QUENCE" "NEW TEMPORARY
   DIRECTORY"
```

Here we used another capability offered by many AmigaDOS commands: the ability to work on multiple files at once. You can list up to ten files with the DELETE command; just separate their names with spaces. AmigaDOS will protect you from another kind of accidental damage by refusing to delete a directory until all of the files and directories in it are already gone. If for some reason you want to force such a deletion regardless of the contents of the directory, you can use the optional ALL argument. The command

```
DELETE "NEW TEMPORARY DIREC-
   TORY" ALL
```

would delete that directory and everything in it—if we had not already removed it. If you tried that command now, AmigaDOS would notify you that there was no such directory.

These commands show only the basic capabilities of AmigaDOS; the CLI offers you many more. Your AmigaDOS User's Manual details the commands. Better still, make a spare Workbench disk that you can afford to lose and just play around. Either way, you will find that the CLI offers you a powerful way to work with your Amiga. ■

Mark L. Van Name and Bill Catchings are contributing editors to AmigaWorld. *Write to them at 10024 Sycamore Road, Durham, NC 27703.*

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BYTE BOX INBOARD 500

Getting bigger all the time . . .

By Bob Ryan

THE BYTE BOX, from Byte by Byte, and the Inboard 500, from Spirit Technology, both expand the memory of your Amiga 500. The similarity ends there, however, because the Byte Box connects to the Amiga 500 expansion bus while the Inboard 500 plugs directly into the socket of the 68000 chip. I recently installed both devices on my Amiga 500 and discovered that there is a right way and a wrong way to do anything.

The Byte Box is a metal case 1½ inches high, six inches wide and 9¾ inches deep that can hold either 512K, one or two megabytes of expansion RAM or none at all. The Byte Box comes with its own power supply so that it doesn't draw power from the Amiga 500. The memory in the Byte Box is fast RAM; it isn't accessible by the Amiga custom chips, so the 68000 can read and write to it without wait states. The Byte Box is auto-config; the memory it contains resides in the standard Amiga auto-config memory space and is automatically added to the system at power-up.

The Byte Box comes with a 10-page manual that explains how to hook it up and how to install RAM chips. A disk containing diagnostic software for texting the Byte Box RAM is also included. The Byte Box does not pass through the expansion connector (you cannot hook other devices onto the box), so the Byte Box must be the last or only device on the bus.

The Inboard 500 is a printed circuit board that can hold zero kilobytes, 512K, one meg or 1.5 megabytes of fast RAM along with a battery-backed clock/calendar. It draws its power from the A500, which can be a cause for concern, as the A500 has a limited power supply. Although the Inboard contains the logic that permits the Amiga 500 to recognize and use it's memory, the board is not auto-config. Depending upon how you configure the board, the memory will be added to your system beginning at either $C00000 or $C80000, not in the auto-config space that begins at $200000.

The manual for the Inboard 500 is contained on disk, which means you need a printer to get a hard copy. This is very important because the installation of the Inboard is a complex matter. The disk also contains digitized pictures that illustrate the installation process. However, I didn't find these helpful because my A500 was, of course, turned off during installation of the board. The disk also contains chip-testing software.

ONTO THE BUS OR INTO THE CASE

Attaching the Byte Box was simple; I stuck the box onto the Amiga 500 expansion connector, attached its power supply, and plugged the power supply into the wall. When I booted my A500, the memory in the Byte Box was added to my system. Total installation time was less than one minute.

Installing the Inboard 500 was much more difficult. I first removed the A500's plastic cover using a torque screw driver, unplugged the keyboard and removed the RF (radio frequency) shielding. I then carefully pried the 68000 chip from its socket on the left side of the motherboard and placed it into a socket on the Inboard 500. Up to this point, the installation procedure was going smoothly. I ►



Simple expansion—just plug it in and forget it.

then tried to plug the board into the 68000 socket. That's when I discovered that I couldn't match the Inboard's pins to the socket without bending the single in-line package which creates monochrome composite output. Holding my breath, I bent the package back without breaking the pins or the solder.

Once I had the pins lined up I tried to seat the board in the socket. It wouldn't stay put. According to the manual, there are three capacitors on the A500 motherboard that can interfere with installation of the board. The manual reccomends that you bend the three capacitors to make the board fit. Once again, I took a deep breath and bent the pins on capacitor C307, C814 and C815 as well as on a single in-line package (RP104) just in front of the 68000 socket. They all survived the ordeal intact.

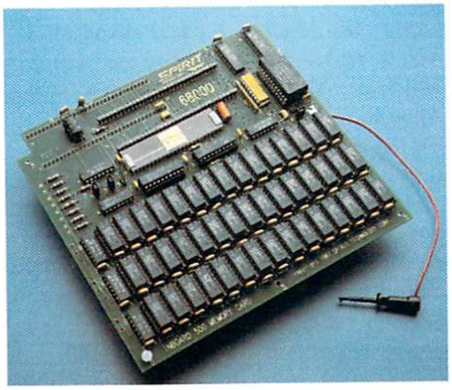
The Inboard, however, still didn't seat properly. Two plastic screws designed to keep the Inboard a discrete distance above the motherboard were not, in fact resting on the motherboard, but on chips and other components. Once I removed these screws from the Inboard I was, with a good deal of rocking and pressing, finally able to plug the board into the socket.

After attaching a clip to the Gary chip and performing a memory test, I configured the board using jumpers and closed up my machine. Total installation time was nearly three hours.

Once installed and configured, both products worked fine, although the clip from the Inboard to the Gary chip fell off once requiring me to take my A500 apart again to reattach it. The Byte Box didn't give me any difficulties.

During the one week I had the Inboard installed I had no problems running the Inboard 500 on the A500's limited power supply. I didn't notice any signs of overheating either, even though the A500 is not designed to be expanded internally (with the exception of the A501 card and compatibles.) However, I still have reservations about power and heating because these problems won't necessarily show up after only one week. If you use the Inboard, I recommend you get a beefed-up power supply for your A500.

I tested the Byte Box in all its memory configurations, and it added up to two MB of RAM to my one-meg A500 for a total of two-and-a-half megabytes. While the Inboard also worked with the A501 memory board, they aren't very complementary. The only configuration that let me use all the memory on both the A501 and the Inboard was the 512K Inboard. This combination netted me 1,426,192 bytes of memory with Workbench—just what you'd expect. A one-megabyte Inboard and a A501-equipped Amiga 500 should have yielded over 1.9 megabytes but actually resulted in a less than 1.7MB system. According to customer support at Spirit Technologies, the missing memory space is used by some custom PAL



A 1.5MB Inboard with jumper.

chips on the Inboard. Be aware, therefore, that you won't get all the memory you pay for if you install an Inboard with more than 512K into an A501-equipped machine, or an Inboard with over one meg into a standard 512K A500.

If you want to avoid losing memory to PAL chips, you can jumper the Inboard so that the A500 doesn't recognize it at startup. You can then use a progam called Addmem to add the Inboard memory to the system memory pool. The main problem here is that you may encounter memory conflicts with any autoconfig devices attached to the A500 unless you know exactly where to add the memory.

The Byte Box expands your Amiga 500 the way it was meant to be expanded; you just plug it in and forget about it. You don't even need a manual, although the one supplied is excellent. I recommend the Byte Box highly.

The Inboard is a different story; it expands your A500 in a way your A500 was not meant to be expanded. Consequently, installation is tricky and there are ongoing concerns about overtaxing the power supply and interfering with the normal flow of cooling air inside the case. On the positive side, the Inboard does keep the expansion bus free and it doesn't take up any more room on your desk. Don't buy the Inboard in place of the A501 board; the memory on the A501 may one day become chip RAM if Commodore upgrades the Agnes chip in the A500. In conjunction with the A501, you waste RAM (or lose the automatic features of the Inboard) if you have over 512K RAM on the board. All in all, the Inboard is more trouble than its worth; I don't recommend it.

Whether you opt for the Byte Box or the Inboard, you should probably buy your A500 RAM expansion device unpopulated and buy the RAM chips separately. Adding chips to either device is easy and much cheaper than buying populated boards.

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Byte by Byte
Arboretum Plaza II
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Austin, TX 78759
512/343-4357
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Inboard 500
Spirit Technology Corp.
220 West 2950 South
Salt Lake City, UT 84115
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SOUND LAB

Hark! Help is here for your Mirage.

By Steve Quinzi

SOUND LAB IS one of those rare commercially available programs that supports existing musical hardware. Sound Lab works with the popular Mirage Digital Sampler by Ensonic, transforming Mirage's original cumbersome user interface to a more fluid setup.

An eight-voice sampler (available in both keyboard and rackmount form), Mirage offers multi-sampling, internal ►

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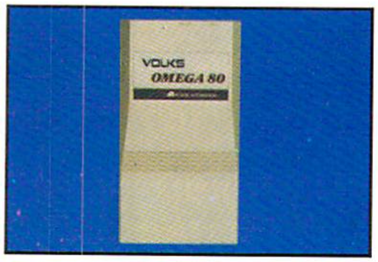
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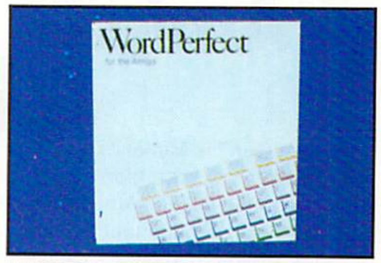
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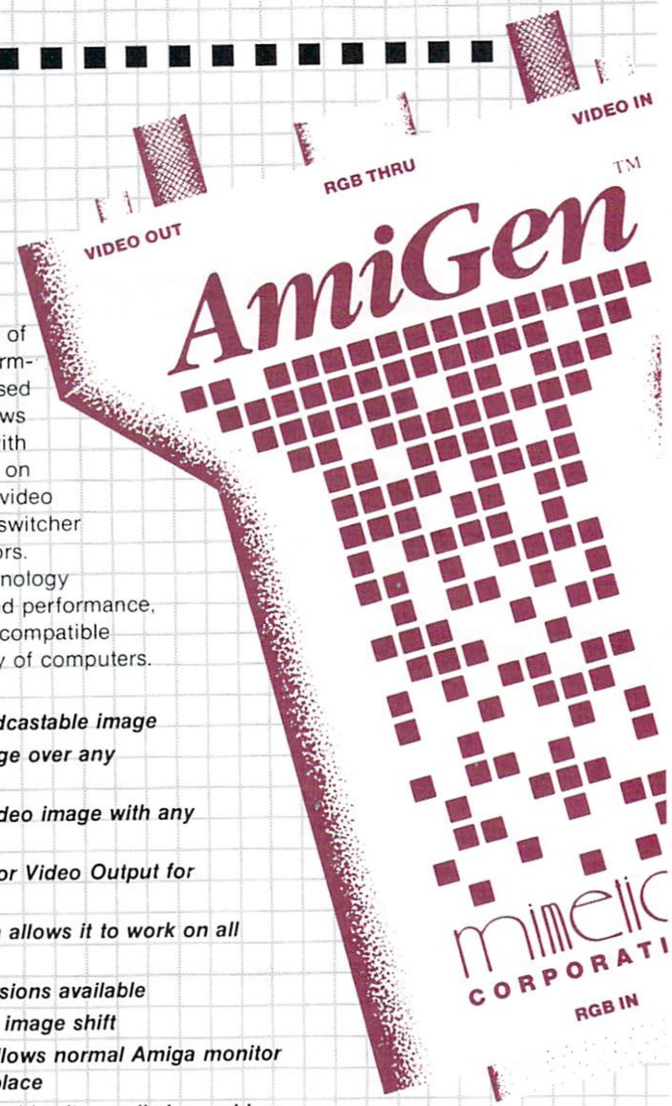
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sound synthesis, a modest assortment of sample-editing features and relatively good sound quality. To offer the product at a low price (another feature contributing to its popularity) they had to cut corners somewhere, right? Yes, all operation is done by way of keypad and a two-character alpha-numeric LED window that displays an array of cryptic codes. That's where Sound Lab comes in. Sound Lab transfers control of the Mirage to the Amiga, requiring not so much as a touch of the keypad. Also, the program adds a number of editing features that greatly enhance the Mirage's power.

Sound Lab seems to be geared toward the professional music market, particularly to those who already own a Mirage (Sound Lab's Macintosh counterpart is already established). The program is mainly mouse driven, utilizing pull-down menus, icons and graphics. Hard-disk owners will be happy to know that the program disk is not copy protected.

In addition to a Mirage, the system requires at least 512K of memory, two disk drives, a MIDI interface and MASOS-M, a special version of the Mirage Advanced Sampler's Operating System (which is included in the software package). The Sound Lab package includes four disks: the program, a special Workbench and two copies of MASOS-M (one primary and one backup). To start Sound Lab, insert the MASOS-M disk in the Mirage disk drive while the Mirage is connected to the MIDI interface. Once booted, three windows appear on the screen: Overview, Waveform Series and Keypad. These windows form the nucleus of Sound Lab.

Before editing sounds, you must transfer them to the Amiga from either the Mirage's memory (through MIDI), a Sound Lab wave data file or from an IFF file (IFF files must be converted to Sound Lab files after loading). Once transferred, the wave data is displayed in the Overview window as a peak envelope waveform. If the data was multi-sampled, the window shows all waveforms as a series of peak envelopes, highlighting the one currently selected. The highlighted waveform can be heard through the Amiga's audio output by clicking the "play" icon. The Waveform Series window, which is display only, shows the selected waveform in detail. The viewing density of this window is variable from one to eight "pages" per display, a page equalling 256 bytes of Mirage sample data.

There are two other editing windows, which the manual refers to as secondary: Loop Splice and Page. Loop Splice "wraps" the loop around and visually lines up one end with the other. This creates good (in some cases perfect) loops with a minimum of effort. The Page window displays all sample data for a particular wave. Here you can rotate, interpolate or redraw, or even draw a wave from scratch. For more extreme editing, the program offers cut, copy, paste and add commands.

One particularly interesting feature is the display which shows waveforms with pitch shifts in three dimensions. This display cannot be edited, but it is interesting to watch the evolution of the inherent phase relationship.

Sound Lab greatly simplifies access to Mirage's synthesis parameters; the parameters are displayed on-screen so you can use the mouse to change them. The program also allows easy keyboard assignment. All five Mirage keyboard octaves are displayed on the screen; you assign sounds by clicking on a waveform, then dragging over the desired keyboard zone. Sampling is simplified, too. You can set all the sampling parameters—rate, length, threshold, and so on—from the Amiga. You must still execute the actual sample command from the Mirage itself, however. The LED window acts as an input level meter.

You can save data to a Mirage disk, to Sound Lab or to a separate data disk. Data in the Sound Lab format can be either a single sample (a "wave data" file), a group of samples (a "sound" file) or a list of all parameters exclusive of sample data (a "template"). This provides an easy way to catalog your Mirage sample library. If you prefer to save a sample in IFF format, you can do so by using the "convert" command. I found that this takes a little bit of work, though; for some reason, every sample I transferred emerged carrying a finale of noise. To fix this, I loaded the converted samples into Audio Master (Aegis) and edited the noise; the final product was indistinguishable from the original Mirage sample. This fantastic feature allows you access to the huge base of Mirage sounds.

I was a little disappointed by the fact that the Amiga Sound Lab version does ►

not include cross-fade looping and 3-D print out—two features present on the Macintosh version. I was also frustrated to find that, with 512K of memory, the program runs slowly because it is constantly reading from disk. While I didn't have extra Amiga memory with which to test the program, I did have access to a Mac Plus with one megabyte of RAM and found, testing the Mac version, that Sound Lab can run very fast. The program also suffers from the common ailment of screen flicker. The usual remedies—a high-persistence monitor, polarizing screen filter or sun glasses—are prescribed in the manual.

Despite these minor complaints, Sound Lab is a great program. It's packed with powerful and professional features, it's clearly laid out and, for anyone already familiar with electronic music technology, it's relatively easy to learn (thanks to a well-written manual). If you own a Mirage or intend to buy one, an investment in Sound Lab is worthwhile. I commend Blank Software for releasing the Amiga version; if the Amiga is going to make it in the professional music market, it's going to need more software like this.

Sound Lab
Blank Software
1034 Natoma Street
San Francisco, CA 94103
415/863-9224
$299.95
512K required.

APL.68000

If your Amiga is readying for a trip to MathVille, it may want to brush up on the native tongue.

By David T. McClellan

UNLIKE SPOKEN LANGUAGES, which sprung mainly from the need to tell your neighbor which rock you were going to hit him with, computer languages were *designed.* At least this was the case with APL (A Programming Language). Pioneered over 20 years ago by Dr. Kenneth Iverson as a notation for describing mathematical algorithms, APL has now arrived for the Amiga under the name APL.68000. Like Fortran, APL.68000 is math intensive and is particularly good for solving linear-algebraic vector and matrix operations.

Because APL is an interpretive language, you don't need to build programs with an editor, then compile and link them. Instead, you can try out ideas and one-line expressions and then construct larger programs from them (as with BASIC). APL knows arrays intimately—from zero dimensional single numbers or scalars, to one-dimensional vectors of numbers or characters, to two dimensions (matrices) and on up. The variables are not declared as they are in C or Modula-2. Instead, APL determines a variable's type on the basis of the number, array or string assigned to it at the time. The language also provides data files containing all the programs and variables you have defined in a given keyboard session. The most global environment is your current workspace, which you can save and load as one file.

APL has more operators for manipulating data than C, Pascal and BASIC combined. APL's operators are all functions in the mathematical sense; they produce a result from one or more argument(s). For example, the "+" function takes two numbers, lists or tables of numbers, adds them and returns the sum. Each built-in APL function has its own symbol, many of them Greek letters. While the shorthand may look funny, it grows on you; APL programs accomplish a great deal in just a few lines.

APL has mathematical functions (arithemetic, log and trig), logical functions (and, or, not and combinations), relational functions (equal, greater than and so on), number base manipulation and scads of matrix operators (generate, reshape, reverse, transpose, invert, rotate, stick-together and pull-apart, sort, test-for-membership). Add notations for I/O and program branching and looping, and you've got A Programming Language. APL.68000 adds data formatting, data and shared-workspace files and a large set of named functions.

You can also roll your functions—write an APL program with zero, one or two arguments (the arguments can be arrays, so you can feed your function any amount of information). These functions can in turn be called by other functions. Each function returns a result, and can talk to files, the screen or even you, via I/O function calls. All of the functions and global variables you've defined in a given session are named, and remain in your current workspace. You can save, reload or delete workspaces just as you can with BASIC's Save, Load and Kill commands.

Since APL is interpretive, and only *it* understands the characters it uses for operators, you must type in function definitions while running APL.68000. Unlike the APL/SV's slow, awkward line editor, APL.68000 sports a full-screen, mouse-driven editor. APL.68000 is based on APL/SV, but provides better extensions, more natural I/O formatting, many more file functions and hooks into the Amiga environment. Amiga APL.68000 programmers can create windows, menus and dialog box gadgets, do graphics and terminal emulation, make sounds and music, use the clipboard and even create other APL tasks to communicate with.

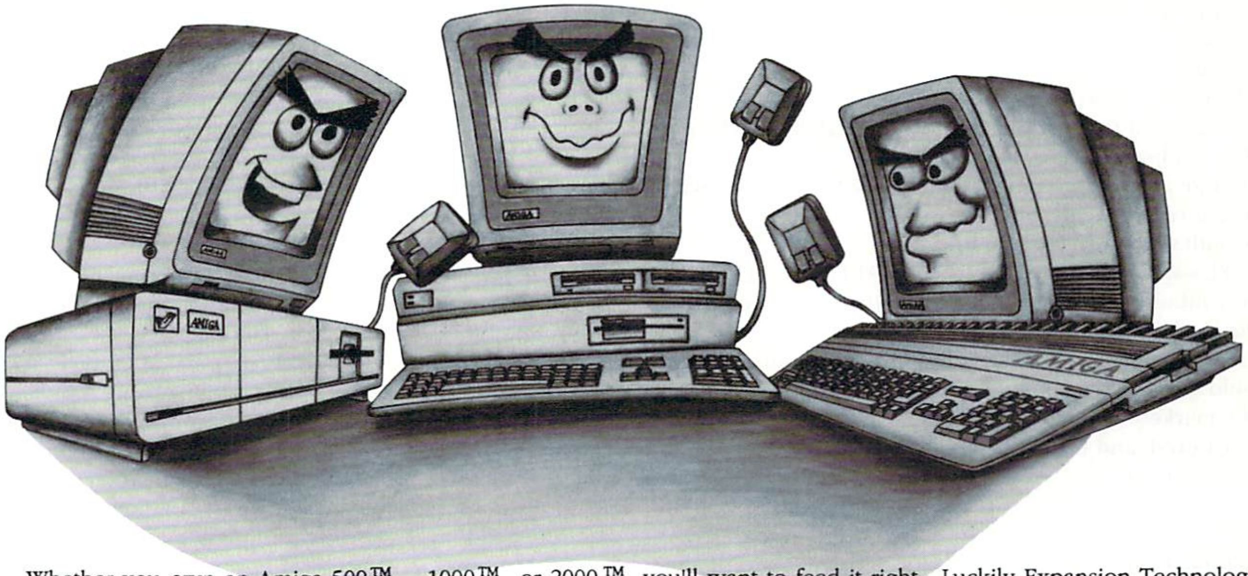
Plenty of documentation is included—a tutorial and reference manual of over 300 pages, a quick reference card and a 60-page Amiga-specific guide. Stick-on labels attach to the sides of your Amiga keys so you can easily refer to the APL symbols while typing.

The View From The Bench

One of APL's functions can invert square matrices. This function will also solve a set of simultaneous equations in multiple unknowns when given two matrix arguments. I did a few matrix-inversion and equation-solving benchmark runs on a 512K Amiga (APL.68000 will also use more memory space, if available) to get an idea of APL's speed.

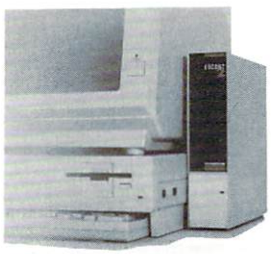
When I tried to solve a 100 × 100 element matrix, APL politely told me I'd run out of room and waited for my next request. (On a 512K Amiga, APL.68000 starts from Workbench with about 96K of workspace if the CLI is not engaged. It requires less with the CLI). I then tried a 50 × 50 matrix—letting APL generate 2,500 random numbers to fill it—and a 50 × 1 column vector of the equation values. One minute and seven seconds later it came back with the answer. Two more runs with new data each took the same amount of time. APL didn't have room to invert that matrix, so I tried a 25 × 25 matrix which it inverted in 31 seconds. Incidentally, APL solved the 25 equations within the matrix in 10.5 seconds and executed a 10-equation matrix in just over a second. ►

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To test for accuracy, I let APL.68000 compute several three-by-three and four-by-four arrays and then hand checked the results. I found the APL-generated results were extremely accurate. The documentation indicates that APL stores numbers accurately to 15 decimal digits, which is sufficient for most applications.

APL.68000 is a good tool for linear algebra or other mathematical problems dealing with large arrays of numbers. Don't buy it as a replacement for C or Amiga Basic, unless you are looking for a tool with APL's special talents, and if you're doing symbolic math or writing *The Home Checkbook Handler,* it's not appropriate. I really liked the implementation and would heartily recommend it to anyone in the market for a good APL. It's fast, full featured, and did what the documentation claimed.

APL.68000
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Westwood, NJ 07675
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512K required.

Music Mouse

An inventive composer or just a squeaky rodent? The verdict from our professional (Michael) and our amateur (Gary).

By Michael Brown and Gary Ludwick

ALL THE ELECTRONIC instruments that have been invented in recent years (keyboard, drum and guitar synthesizers) are basically just electronic versions of instruments that already existed. While MIDI synthesizers provide players unprecedented capabilities, the instruments themselves are not very different from their acoustic counterparts. Music Mouse, on the other hand, is like no other instrument, letting the professional or amateur compose music with the mouse.

Professional Squeaking

Music Mouse lets you control the Amiga's four voices by moving the mouse along its X and Y axes, which in turn control four, brightly colored cursor bars touching piano keyboards bordering the screen. Holding down the left mouse button temporarily mutes the sound, so you can position the mouse to play a particular pitch without playing all the keys in between. The samples provided with the program are very high quality; I especially like the piano, flute and marimba. The program will play any IFF sound file, so you're not limited to what's on the disk.

Virtually every key controls some feature of the Amiga's sound generating facilities or external MIDI keyboards. Successively depressing Q, W, E, R, T and Y, for example, changes the harmonic structure from Octatonic to Chromatic to Middle Eastern to Diatonic to Pentatonic to Quartal. Other keys control dynamics, articulation, tempo, transposition and pitch quantization. All the controls you would use most frequently are activated by a single keystroke, so you don't have to stop making music to turn up the volume or change the tempo.

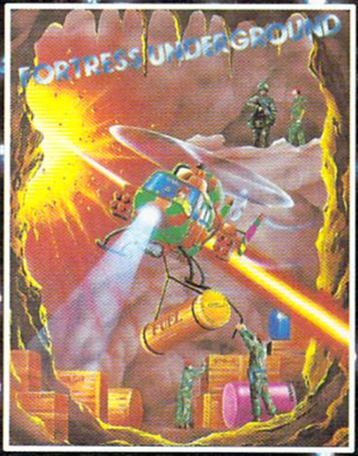
Music Mouse not only controls sound generation, but the Amiga's visual dis- ►

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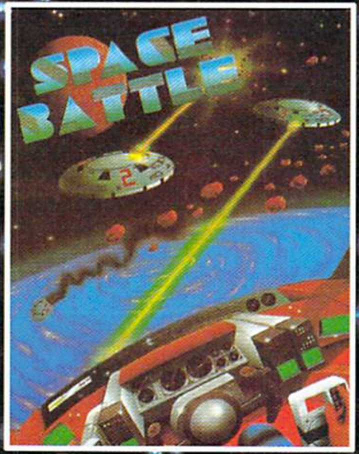
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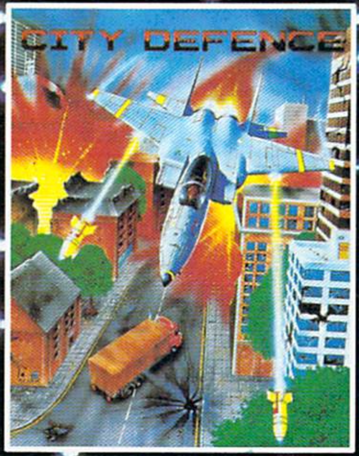
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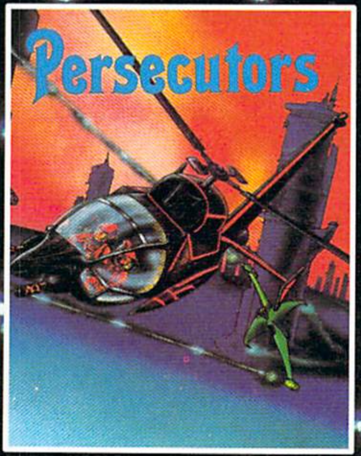
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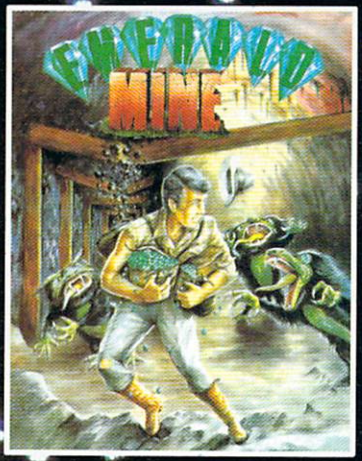
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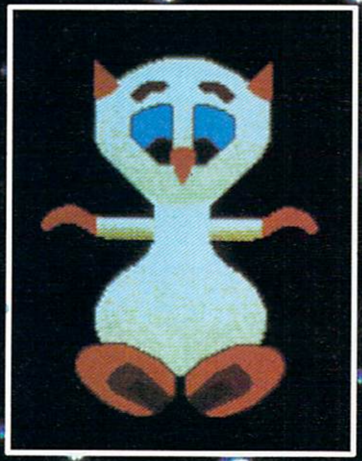
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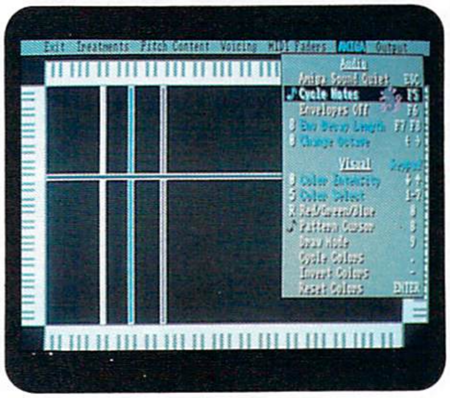
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play as well. The arrow keys control red, green and blue color intensities. Pressing the nine on the numeric keypad activates a draw mode. When you press a note its companion cursor bars appear on the screen, building up intricate designs over a long series of notes. In the draw mode, you find yourself sculpting music with the colors and patterns of these bars as much as with the sounds the program creates.

You can have a great deal of creative fun with Music Mouse and the Amiga's internal synthesizer, but playing MIDI gear is even better. Music Mouse can function as a stand-alone controller for any MIDI synthesizer. The program can send all four melodic voices on MIDI channel one or send one melodic voice each over channels one through four. From the Amiga's keyboard, you can program all synthesizer functions, including patch selection, breath control, foot control, portamento, after touch, modulation wheel and velocity sensitivity. As a bonus, all keys on the synthesizer remain live.

Be warned: Music Mouse is not a sequencer in itself. Once you are finished playing a composition, it cannot be repeated unless you record your performance with Electronic Arts' Deluxe Music Construction Set or Mimetics' SoundScape (or, presumably, another sequencer such as Texture from Magnetic Music); you would also need a MIDI interface. I ran Music Mouse as a SoundScape module on the patch panel without a hitch.



Music Mouse's Amiga-specific options.

I do have one significant complaint. Although there is no mention of it in the manual, the program is copy-protected, preventing you from making a back-up copy or loading it onto a hard disk. If a developer must put copy-protection on a program, they should at least tell the consumer about it up front. However, the manual does mention that Music Mouse only recognizes MIDI interface units plugged into the serial port.

Music Mouse is a very solid program. It will multitask with itself, but multiple iterations of the program cannot simultaneously access the Amiga's internal voices. While one copy works internally, the others can send out MIDI information or a visual display. I tested it multitasking with SoundScape on a one megabyte A500 and with WordPerfect on a one meg A2000 and never experienced a problem.

The manual is well written and quite comprehensive, covering all aspects of the program from initial setup to using MIDI to multitasking with DMCS and SoundScape. It also provides some exercises to help you become more proficient with the program. A large card maps the keyboard controls for quick reference. Overall, I found Music Mouse ►

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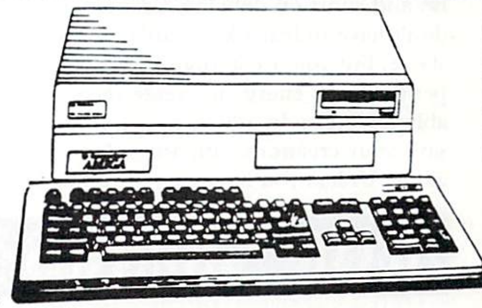
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to be an extremely fun and creatively stimulating program.

A Beginner's Mouseke-tears

Although Music Mouse bills itself as an expert system (software that allows non-experts to perform expert acts), for the beginner the program is long on promise and short on delivery. Granted, you don't have to learn keyboards, notes or staves, but you are going to have to expend serious energy to create recognizable melodies. In addition, you cannot save your creations with Music Mouse alone. Unless you have one of the high-end music programs Music Mouse integrates with, your only recourse is to connect your tape deck and computer, as the manual suggests.

Music Mouse bills itself as an "intelligent instrument." In the sense that you can create nice sounding chords, with no knowledge of music, by rolling a mouse around on a desk, I suppose it is. But, for the amateur who knows little about music, the novelty wears off pretty quickly. You can only listen to chords and play with gadgets for so long before you yearn for something recognizable and repeatable.

At times the manual is too technical and at others too ethereal, and it leaves out one important detail. Music Mouse is apparently copy protected, but no mention is made on the packaging or in the manual. If a software publisher insists on doing this, they ought to own up to it and provide proper cautions to the user.

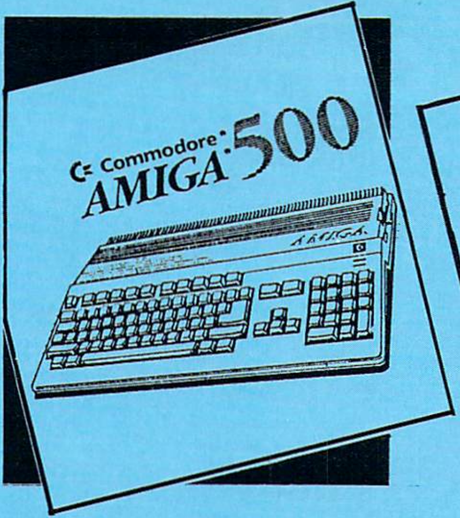
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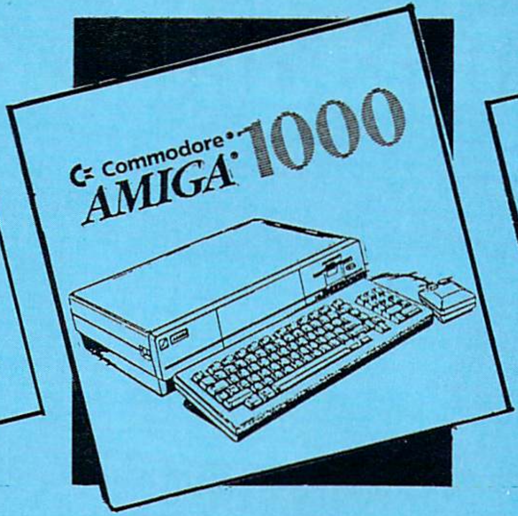
GAME SHORTIES

Plutos

"YOUR MISSION IS to destroy as much of the alien fortress' defenses as you can." Short, sweet and right to the point. Plutos is an arcade game for one or two players. Period. You could probably make up some sort of story to go along with the game, but why bother? This is an arcade game—explosions, blasting aliens, great graphics, no socially redeeming features whatsoever. But that is what arcade games are all about. You have a spaceship that can move around the screen. The alien spacescape (fortress, spaceship, city, whatever, it doesn't really matter does it?) scrolls from top to bottom while stuff flies at you, shoots at you, blocks your path and, well, you get the idea. You rack up points for everything you destroy. You start with four lives and can gain more during the game. The two-player mode is interesting ►

WHY PAY MORE!





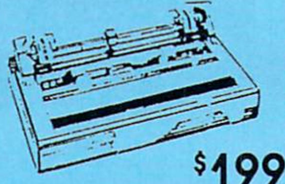


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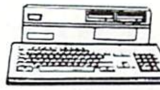
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because you are working as a team, but competing for points and fuel (you run out unless you blast fuel boxes along the way).

Plutos is a good arcade game. It is fast. The graphics and sounds are good Amiga quality. There is nothing deep or philosophical about Plutos, it's just good, clean frenetic arcade action. Joystick junkies will adore Plutos—no thought, no careful consideration, no strategy, just hyperwarped reflexes and mindless destruction.

Playing hints: Blast anything that moves, anything with a number on it and anything else you get the chance to. Avoid anything you can't blast. Invest in a joystick with a rapid fire option. *($29.95, Mindscape, 3444 Dundee Road, Northbrook, IL 60062, 312/480-7667. Joystick and 512K required.)*

—G. Wright

Test Drive

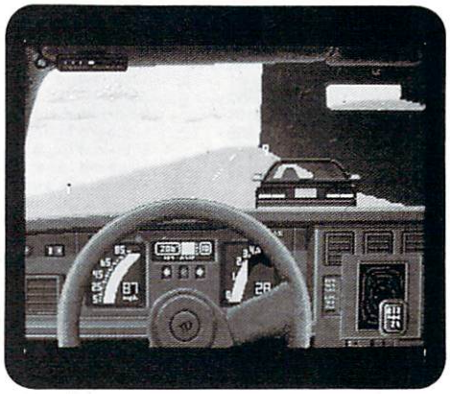
FIVE SEXY SPORTS cars are waiting for you to slip behind the wheel and take a spin. A twisty mountain road is ahead with tight turns, Sunday drivers, potholes and, of course, the police. Simple really, just pop it into gear and go. Keep an eye on the radar detector, take a few chances, and see just how much is really under the hood. The guys at the gas stations along the way are going to clock your time so you'd better make it good. Don't want them snickering behind your back just because you got stuck behind some truck along the way.

But which car to try first? The Ferrari Testarossa? Nice machine . . . takes a while to wind it out from third to fourth, but once it's up there it flies. How about the good ol' American Corvette? Flat out fast, but cornering could be better. Ah, the Porche 911 Turbo. It slips through turns like they were straightaways; a bit tight through third. Then there is that dream car, the Lamborghini Countach—five-speed transmission (real tight between second, third and fourth) and just plain remarkable handling. Decisions, decisions.

You could try all five if you owned a copy of Test Drive from Accolade. Test Drive lets you pick any of the five, and test the limits—both your own and the car's—on a mountain road. The specifications for each car are displayed during the selection stage of the game, and the designers insist that they took extra care to make each car behave on the screen as it does in real life.

You are shooting for the highest average MPH on five stretches of road. You get five chances on each stretch. Your perspective is from the driver's seat, with a reproduction of the car's dashboard in front of you. You control the steering, acceleration, braking and shifting with the joystick. An option lets you shift gears using the car's normal shift pattern or by pushing the joystick forward and clicking the fire button to upshift, and pulling back and clicking to downshift.

The graphics in Test Drive are very good; there is an occasional bug splattered on the windshield, and you find yourself leaning as the car goes around turns. The only place the graphics fall



Pass or perish in Test Drive.

short is on crashes. Cracks spiderweb through the windshield whether you hit an oncoming car, drive over the cliff or hit the side of the mountain—no flames, no plunge over the side, no flying pieces of twisted metal. The music and sound effects are good, too; Accolade used actual sampled sounds from the five cars.

The game's few flaws fall into the "it would be nice if. . ." category. It would be nice if the traffic patterns were randomized (as it is, you could eventually memorize the stretches), and if the screens changed more quickly. The scores could remain on display longer, and it would be nice to be able to pick different tracks or roads. However, these things are minor, and Test Drive is a fun and challenging game. *($44.95, Accolade, 20813 Stevens Creek Blvd., Cupertino, CA 95014, 408/446-5757. Joystick and 512K required.)*

—G. Wright

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Supra advocates hard-disk power for the 500.

Electronic Kiosk

HAVE YOU EVER wanted to operate a bulletin-board dating system? This and other feats are possible with **Custom BBS!,** the customizable bulletin board system. Custom BBS! offers all standard bulletin board features, plus others, such as 75 different message board and file areas, random pop-up quotes and system-operator voice paging. The messaging system allows you to respond to previously-written messages, and to read a message and all of its replies before moving to the next; the file system supports several transfer protocols. $100 gets you the bulletin board (thumbtacks not included). Contact Celestial Data Systems Inc., 279 South Beverly Drive, Suite 1010, Beverly Hills, CA 90212, 213/839-7828. ►



This fall's hot new program stars 4 sexy Europeans and 1 American stud.



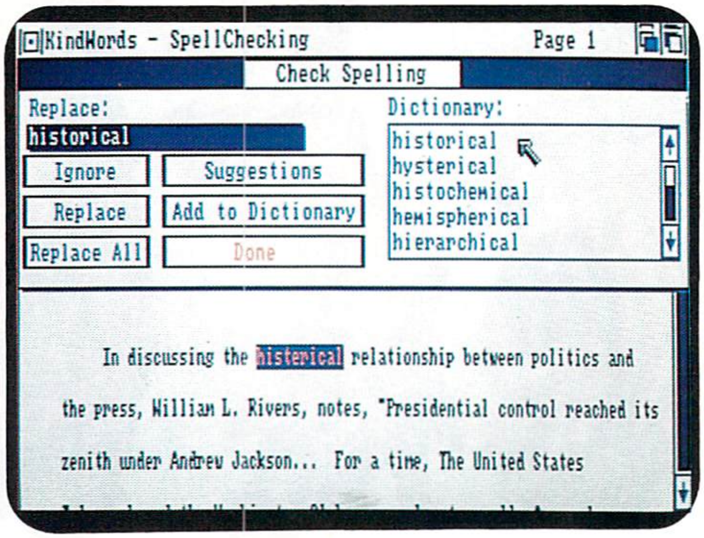
This fall's sizzling new program doesn't feature an Alexis, a Krystle, or even a Magnum, but it will have some pretty racy scenes. • Meet the exotic cars of Test Drive, Accolade's incredible driving simulation. There are the legendary greats from Europe: Ferrari Testarossa, Lotus Turbo Esprit, Porsche 911 Turbo and the incomparable Lamborghini Countach. And to make Test Drive a truly international event, there's the classic American star—the Chevrolet Corvette. • Test Drive allows you to experience firsthand the awesome driving characteristics of each renowned performer. They accelerate like the real thing. They handle like the real thing. They brake like the real thing. In fact, the animation and graphics of Test Drive are so realistic, you'll swear the G-Force has you pinned to your seat. • Accolade's Test Drive. It's one program that will definitely burn up the screen. • Accolade. 20813 Stevens Creek Boulevard, Cupertino, CA 95014. 408-446-5757. ACCOLADE™

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Circle 39 on Reader Service card.

WARM FUZZY WORD PROCESSING

A WORD PROCESSOR, **KindWords** includes multiple font styles and sizes and a 90,000-word spelling checker that not only catches mistakes, but suggests corrections. The fully-integrated graphics mode enables you to crop and manipulate images in 16 colors within the word-processing application. Other features include find and replace, unlimited document length, mail merge and global select. The package is $99.95 from The Disc Company, 3135 South State St., Ann Arbor, MI 48108, 313/665-5540.



The kindly spelling checker in action.

FIXIN' FONTS

NEON GLOW, 3-D block, thin edge, fat edge, emboss, balloon—these are just some of the effects you can add to your video text with **VideoTitler.** The program works with Amiga, Zuma and multiple-color fonts, and those from the poly-font system that you can rotate, stretch, even precisely adjust with manual kerning. You can edit all fonts, as well as distort, invert, mirror, compress, tilt or quarter images. VideoTitler supports all screen resolutions, and IFF windows and pictures. You can also add animations created with VideoTitler itself, or with VideoScape 3D. $49.95 includes a slideshow module to display your work. Contact Aegis Development, 2210 Wilshire, Suite 277, Santa Monica, CA 90403, 213/306-0735.

BALLPOINT LIGHT

GIVE YOUR MOUSE a rest from pointing and drawing with the **184-A Light Pen and Amiga Light Pen Driver** from Inkwell Systems. Compatible with all Amiga models (including the German 2000), the Light Pen works with all programs that use a standard Intuition pointer interface. The pen's two touch-activated switches let you replace or alternately use the mouse. You can run the Light Pen Driver's transparent program from the CLI or Workbench. The disk also provides on-line help and, for close-ups of intricate work, Zoom Scroll. The Light Pen and Driver sell for $129.95. Use a conventional pen to write to Inkwell Systems, 5710 Ruffin Rd., San Diego, CA 92123, or dial 619/268-8792.

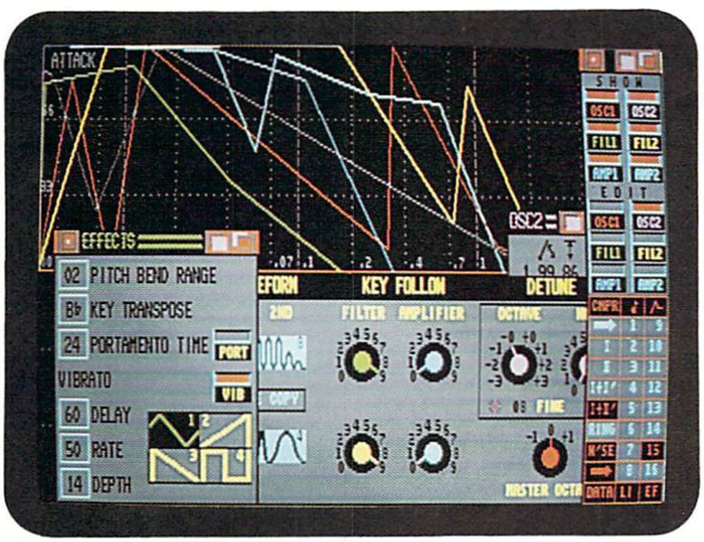
Who You Gonna Call?

THE ONLY ONE who need be offended by someone yelling "Get Outa My Face (GOMF)" is that pesky Guru. What's all the yelling about? **GOMF,** the error-handling routine that promises to eliminate Guru alert messages. GOMF 2.0 traps and removes errors that occur while using virtually any other program(s). As it automatically configures to work on 68000/68010/68020, you can install it in your startup-sequence. GOMF displays messages, telling you in clear terms what it's up to. It prompts you to end the program that's causing the flagged error and save your data.

If you need crisp, flicker-free, hi-res monochrome video output, and your sunglasses aren't cutting the mustard, consider the **TTL High Resolution Monitor.** The monitor plugs into your RGB port and allows pass through; a disk with a special Workbench font and a one-year warranty are included. If you have a 2000 or a Sidecar, you may want to use the TTL in PC hi-res mode. Whether it's a Guru-buster ($34.95) or a flicker-buster ($99) you seek, call Hypertek/Silicon Springs Development Corp., 120-1140 Austin Ave., Coquitlam, BC, Canada V3K 3P5, 604/939-8235.

Name It Nicholas

USING MIDI, **C-ZAR** rules the Casio CZ-101 and CZ-1000, turning the synthesizers' sounds and programmability into mouse-controlled imagery. This amiable autocrat offers over 200 pre-programmed instruments and sound effects that you can modify. Envelopes are color-coded and can be displayed singly or in groups, or overlaid. Other features include true-time display, a sequence recorder with automatic playback, a librarian that allows you to catalog and file your creations and eight programmable tone mixes that can be saved with each sound bank. For $195 you can qualify for C-ZARdom! (Amiga to MIDI interface is $55.) Contact Diemer Development, 12814 Landale Street, Studio City, CA 91604-1351, 818/762-0804. ►



C-ZAR enhances your powers.

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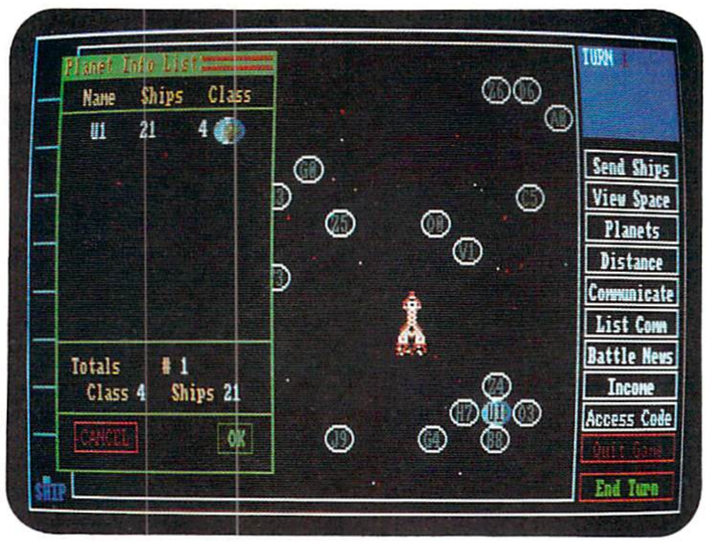
INTRODUCED LAST year for Commodore's C-128, the **Accountant,** a four-part accounting system (general ledger, payroll with bidirectional posting, accounts receivable and payable), is now available for the Amiga. Based on a one-megabyte system, the multitasking program includes check writing (ten check registers), point-of-sale invoicing and an invoice generator that posts directly to the sales journal. Sales and purchase journals employ a batch system. To ease any fear of losing data, the Accountant automatically saves to disk during computing. It also offers help windows for each input field.

New modules are already being planned. Registered owners can obtain all future upgrades for the cost of postage and handling once they join the Update Club, and graphing and financial analysis capabilities will be offered for $9.95. Inventory control and cash register/inventory systems are scheduled to be released later this year. The Accountant is $299; contact KFS Software Inc., PO Box 107, Largo, FL 34649-0107, 813/584-2355.

Galaxy Ho!

"DEAR DIARY: WE have become a truly space-age society, with computers, satellite communications and space travel. But while our technology advances, we're quickly depleting our planet's resources. As emperor, I am responsible. I guess it's time to deploy our starship fleet and mine the nearby planets so we can continue our development rate and keep the people happy."

If this doesn't sound like one of your entries, then you haven't conquered the galaxy of **Stellar Conflict.** The game accommodates one to four computer or human players and offers three levels of play, randomly generated galaxy maps, multiple windows and graphic displays of current standings, timed turns and much more. Blast $39.95 or further inquiries off to PAR Software Inc., PO Box 1089, Vancouver, WA 98666, 206/694-1539 or 800/433-8433.



Hi ho, hi ho, it's off to mine the planets.

Words, Works, and a Television Studio

A WHAT-YOU-SEE-IS-WHAT-YOU-GET word processor with built-in WYSIWYG database, **Write and File** will sort, select and merge documents. The $99.95 program features on-screen and hardcopy multiple fonts and a 100,000-word spelling checker among its word-processing functions. The database provides convenient accessibility to lists, files and accounting.

The Works combines Micro-Systems Software's Scribble! word processor, Analyze! spreadsheet and Organize! database into one package for $199.95.

Are you that famous **TV★SHOW** producer—the one who uses wipes, fades, rolls, zigzags, cuts, weaves, and all those other effects? You could be! Just animate IFF screens in any resolution (TV★SHOW supports overscan, NTSC, PAL and HAM images) to create a professional presentation for $99.95. Tune in to Brown-Wagh at 16795 Lark Ave., Suite 210, Los Gatos, CA 95030, 408/395-3838.

Plus > 1000

THE IMPROVED desktop publishing program from Northeast Software, **Publisher Plus,** replaces Publisher 1000. Automatic font sizing (from two to 127 points), new text editing and PostScript features are but a few of the upgrades. The software also features a scaled-down price of $99.95, and upgrades are available to Publisher 1000 owners for only the cost of return postage. Northeast Software Group's distributor is Brown-Wagh, 16795 Lark Ave., Suite 210, Los Gatos, CA 95030, 408/395-3838.

Take One and Call Me in the Morning

DR. T's, THAT music medic, offers several prescriptions to keep you sonically healthy.

The **Keyboard Controlled Sequencer,** an advanced sequencing environment, supports internal Amiga sound samples. The sequencer features an automated 48-track tape recorder mode, the ability to load 16 songs as well as individual sequences or a group of tracks, a built-in variations generator, full editing of all MIDI parameters . . . the list goes on and on.

Need a **patch editor/librarian** to cure your blues? The Roland MT-32, Roland D-50, Yamaha DX7 and Ensoniq ESQ-1 synthesizers are each covered on separate disks, while the Yamaha TX-81Z, FB01, DX100 and DX27 share one disk. The editor/librarians are totally mouse driven; you can play any note, adjust velocity or regulate the controller without touching the synthsizer, and audit from the bank screen by clicking on any voice name and playing the mouse. Other features include point-and-drag envelope editing, display editing of all instrument parameters and randomize-mask of all editable parameters.

Everything in the doctor's black bag of new products employs multitasking and any standard serial MIDI interface. The Keyboard Controlled Sequencer sells for $249 while the editor/librarian disks chime in at $129 each. Take note: Dr. T's is at 220 Boylston St., Suite 306, Chestnut Hill, MA 02167, 617/244-6954. ■

Circle 169 on Reader Service card.

Circle 214 on Reader Service card.

HELP KEY

No concern is too trivial, no problem too tangled for Load-and-Run's healing hands.

By Louis R. Wallace

MANUAL MALAISE

Q: *Two questions: What exactly is the Amiga ROM Kernel manual? Second, to use my Brother Professional 90 typewriter with my Amiga, the manual states I need a C-60 plug to connect it, but does not give the connection's pinouts. Can you help?*

R. D. Bozeman III
San Francisco, CA

A: The Amiga ROM Kernel Reference Manual is actually two books, *The Amiga ROM Kernel Reference Manual: Libraries and Devices* ($34.95) and *The Amiga ROM Kernel Reference Manual: Exec* ($24.95). The Libraries and Devices volume covers all the graphics support routines (drawing, layers, animation and text), all I/O devices (audio, timer, console, keyboard, input, gameport, narrator, serial, parallel, printer and clipboard), the Workbench and the floating-point math library. The Exec volume covers the Amiga's multitasking executive system. Exec handles the various tasks, communication between the tasks and the Amiga, plus the sharing of resources such as drives, memory or system software routines. Both books are part of the official technical documentation of the Amiga computer line published by Addison-Wesley. *The Amiga Hardware Reference Manual* ($24.95) and *The Amiga Intuition Reference Manual* ($24.95) round out the series.

I couldn't find any information on the pinouts of your Brother Professional 90. I suggest you send Brother a letter via registered mail. Good luck!

DELUXE CONVERSIONS

Q: *Can I convert Graphicraft files to normal IFF files so I can edit them with DeluxePaint?*

John Pollard
Fort Riley, KS

Q: *I want to use DeluxePaint to create displays for my Amiga Basic programs. How do I load the pictures into Amiga Basic?*

D. Jenkins
Forsyth, GA

A: If you want to use IFF images from Amiga Basic, you should check out the programs on your 1.2 Amiga Basic disk. LOADACBM will load older Graphicraft ACBM (Amiga Contiguous BitMap) pictures and display them, while SAVEILBM saves an Amiga Basic screen to the Amiga's standard IFF ILBM (InterLeaved BitMap) format. By combining these two programs, you can load a Graphicraft picture, then save it back as a DPAINT IFF picture, that DeluxePaint will load. To transform images in the opposite direction, use LoadILBM-SaveACBM, which converts IFF pictures to the earlier (but faster loading) ACBM format. ScreenPrint dumps the current Amiga Basic screen to any graphic printer supported by Preferences. Using these programs as subroutines in your programs, you can display and print pictures from Amiga Basic.

TALK TO ME

Q: *I am interested in making the Amiga easier for blind people. Do you know of any way to make the Amiga's voice read the screen? Many computers have a place in memory where the information on the screen can be PEEKed to find the ASCII values of the screen contents. Can this be done on the Amiga?*

K. Wehr
Watsontown, PA

A: No. Since the Amiga's screen is entirely bitmapped, it doesn't have any location you can simply PEEK to find the letter at a given screen location. Since you can use different fonts and character sizes on the screen, it is extremely unlikely anyone could make a program that could interpret the bitmap patterns that make up the letters.

Of course, you can use its voice to read a text file from AmigaDOS using the SAY command (found in the SYSTEM drawer). For example, you can instruct the Amiga to read an ASCII file called LETTER.TXT out loud with: SYSTEM/SAY -X LETTER.TEXT. The -X means the machine is to read the file whose name follows the -X option. Other options available with the SAY command allow you to specify a male, female, natural or robot voice, as well as change the pitch or speed. To experiment with the SAY command, from the CLI type SYSTEM/SAY and then press the return key. You will get two windows with instructions.

PROPORTIONAL JOY

Q: *I currently use an Atari/C64 type joystick in port two of my A500. Unfortunately, it only has eight directions and one button. Can the Amiga use the two-button, 360-degree analog joysticks used by Apple IIs?*

J. Chung
Urbana, IL

A: Since the Apple joysick's plug is the wrong gender (male), you can't use it directly, but according to *The Amiga Hardware Reference Manual*, the Amiga can use a proportional style controller (not yet on the market) that will allow directional readings from zero to 255 and would essentially be as sensitive as the Apple's analog joysticks.

However, current joystick-controlled software only works with the eight-direction joystick. Just plugging in a proportional joystick doesn't make the software able to understand the signals coming from the port, any more than a joystick-controlled game can understand mouse signals from the second port. ■

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The Pull-Down Menu

The Pull-Down Menu

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B. What will be your next major peripheral purchase?
☐ 1. Monitor ☐ 2. Printer ☐ 3. Modem ☐ 4. Memory Expansion ☐ 5. Disk Drive (hard or floppy) ☐ 6. Sidecar ☐ 7. Gen Lock or Frame Grabber ☐ 8. Music (Midi, Keyboard, etc.) ☐ 9. Other

C. Check all of the endings that best complete this sentence: "Most of AmigaWorld is . . ."
☐ 1. Just Right ☐ 2. Too Simple ☐ 3. Too Complex ☐ 4. Fluff ☐ 5. Useful ☐ 6. Useless ☐ 7. Interesting ☐ 8. Biased ☐ 9. Valuable

D. What topics would you like to see covered in future issues of AmigaWorld? (Please pick three.)
☐ 1. C Language ☐ 2. Amiga Basic ☐ 3. CLI ☐ 4. Telecommunications ☐ 5. Business Applications ☐ 6. IBM Compatibility ☐ 7. Home Applications ☐ 8. Education ☐ 9. Video ☐ 10. Science and Engineering ☐ 11. How others use the Amiga ☐ 12. Buyer's Guides ☐ 13. Comparative Reviews ☐ 14. Music ☐ 15. Graphics ☐ 16. Program Listings ☐ 17. New Products ☐ 18. Opinions ☐ 19. Hardware Projects ☐ 20. Other

E. What are your favorite things about AmigaWorld? (Please pick all that apply.)
☐ 1. Zeitgeist (Editor's Page) ☐ 2. Repartee (Letters) ☐ 3. Interviews ☐ 4. Help Key (Questions) ☐ 5. Features ☐ 6. Tutorials ☐ 7. Hors d'oeuvres (hints/tips) ☐ 8. Advertisements ☐ 9. Reviews ☐ 10. Notepad ☐ 11. Digital Canvas ☐ 12. Articles ☐ 13. Covers ☐ 14. Reader Service Card ☐ 15. "What's New"

F. Which of the following categories do you plan to purchase software from in the next 12 months?
☐ 1. Entertainment ☐ 2. Word Processing ☐ 3. Communications ☐ 4. Spreadsheets ☐ 5. Home Productivity ☐ 6. Programming ☐ 7. Software Development ☐ 8. Video/Graphics Creation ☐ 9. Database Management ☐ 10. Financial Management ☐ 11. Graphics ☐ 12. Education ☐ 13. Music ☐ 14. Hardware Development ☐ 15. Sound/Speech Development ☐ 16. CAD/CAM

G. Have you ever purchased a product after receiving the information you've requested from an AmigaWorld reader service card?
☐ 1. Yes ☐ 2. No

H. Where do you buy your computer products? (Please pick one.)
☐ 1. Computer Dealer ☐ 2. Mail Order ☐ 3. Manufacturer ☐ 4. Discount/Department Store ☐ 5. Other ____________

I. Do you own an Amiga?
☐ 1. Yes ☐ 2. No

J. Where do you use your Amiga?
☐ 1. Home ☐ 2. Work ☐ 3. School ☐ 4. At home for business ☐ 5. Both at home and work ☐ 6. Both at home and school ☐ 7. I don't use an Amiga

K. Is this your copy of AmigaWorld?
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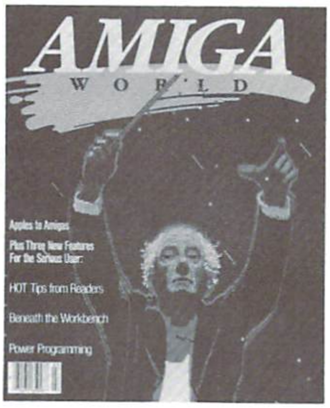
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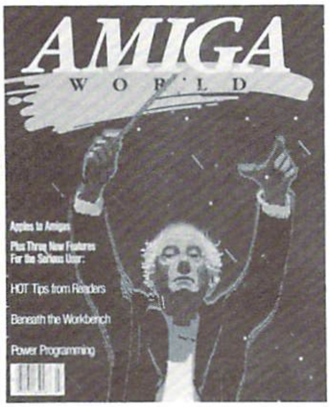
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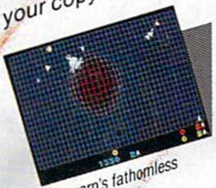
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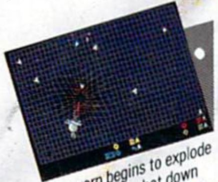
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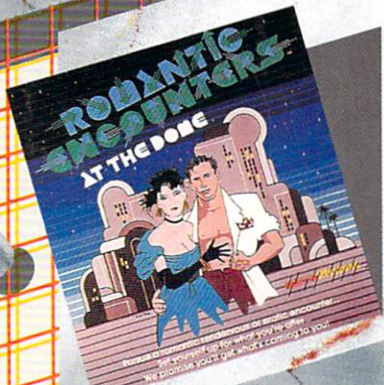


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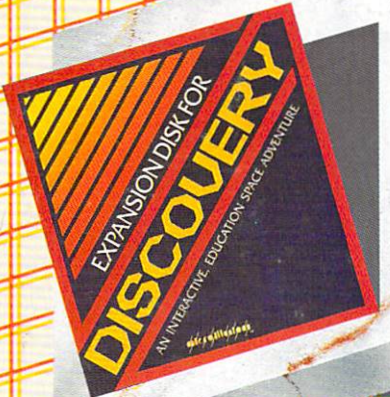


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